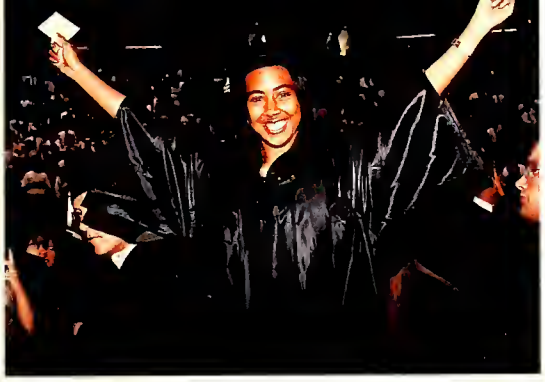

UNC CHARLOTTE

1997-1999 CATALOG

Correspondence Directory

If, after reading this *Catalog*, you have further questions or specific inquiries about the programs of, or admission to, The University of North Carolina at Charlotte, please look below to find the proper office to contact. Address correspondence to any of the offices in care of:

The University of North Carolina at Charlotte
9201 University City Boulevard
Charlotte, North Carolina 28223-0001

Academic Affairs	(704) 547-2225
Admissions	
Undergraduate	(704) 547-2213
Graduate	(704) 547-3366
Brocker Health Center	(704) 547-4617
College of	
Architecture	(704) 547-2358
Arts & Sciences	(704) 547-4303
Business Administration	(704) 547-2165
Education	(704) 547-4707
Engineering	(704) 547-2301
Nursing and Health Professions	(704) 547-4650
Cone University Center	(704) 547-2267
Continuing Education and Extension	(704) 547-2424
Cooperative Education	(704) 547-2361
Counseling Center	(704) 547-2105
Dean of Students	(704) 547-2375
Financial Aid	(704) 547-2461
Graduate School	(704) 547-3371
J. Murrey Atkins Library	
Circulation	(704) 547-2392
Reference	(704) 547-2241
Records/Registration	(704) 547-3487
Residence Life	(704) 547-2585
Student Affairs	(704) 547-2206
Summer Programs	(704) 547-2424
Undergraduate Programs	(704) 547-2045

EMERGENCY NUMBERS

Campus Police -- Emergency	911 (on campus)
	547-2200 (off campus)
Director of Public Safety and Non-Emergency Calls	547-2282
Health Services (radio contact with police)	547-4617
Campus Operator	547-2000

About This Catalog...

Although the publisher of this catalog has made every reasonable effort to attain factual accuracy herein, no responsibility is assumed for editorial, clerical or printing errors, or errors occasioned by mistakes. The publisher has attempted to present information which, at the time of preparation for printing, most accurately describes the course offerings, faculty listings, policies, procedures, regulations and requirements of the University. However, it does not establish contractual relations. The University reserves the right to alter or change any statement contained herein without prior notice.

Graduation Rate Disclosure Statement. Our data show that 59% of the full-time new freshmen who entered UNC Charlotte in Fall 1990 have received a baccalaureate from this institution or another UNC institution as of Fall 1996. In addition, another 7% were enrolled at this or another UNC institution in pursuit of their baccalaureate degree as of Fall 1996. This information is provided pursuant to requirements of the Student-Right-to-Know and Campus Security Act of 1990.

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UNCCHARLOTTE

The University of North Carolina at Charlotte

Undergraduate and Graduate Catalog 1997-1999

Vol. XXVI, No. I

Available electronically at http://www.uncc.edu/catalog/

The University of North Carolina at Charlotte is open to people of all races and is committed to equality of educational opportunity and does not discriminate against applicants, students, or employees based on race, color, national origin, religion, sex, sexual orientation, age, or disability. Moreover, UNC Charlotte actively seeks to promote integration by recruiting and enrolling a larger number of African-American, Native-American, and other ethnically diverse students.

Academic Calendar 1997-1999

Dates pertaining to changes in enrollment and refunds are included in the calendars that appear in the *Schedule of Classes* each semester and in the summer sessions bulletin.

FALL SEMESTER, 1997

Academic year begins . . . . . Sunday, August 17
Orientation, Advising, Registration . . . . . Wednesday-Friday, August 20-22
First class day . . . . . Monday, August 25
Labor Day (no classes)(University closed) . . . . . Monday, September 1
Student recess (no classes) . . . . . Monday, October 13
Thanksgiving recess (no classes) . . . . . Wednesday-Friday, November 26-28
Last class day . . . . . Friday, December 12
Final examinations . . . . . Saturday, December 13, Monday-Friday, December 15-19
Commencement . . . . . Saturday, December 20

SPRING SEMESTER, 1998

Orientation, Advising, Registration . . . . . Sunday-Tuesday, January 11-13
First class day . . . . . Wednesday, January 14
Martin Luther King Day (no classes)(University closed) . . . . . Monday, January 19
Spring recess (no classes) . . . . . Monday-Friday, March 9-13
Last class day . . . . . Wednesday, May 6
Final examinations . . . . . Thursday-Saturday, May 7-9, Monday-Wednesday, May 11-13
Commencement . . . . . Saturday, May 16
Academic year ends . . . . . Saturday, May 16

FIRST SUMMER TERM, 1998

Registration . . . . . Tuesday, May 26
First class day . . . . . Wednesday, May 27
Last class day . . . . . Tuesday, June 30
Final examinations . . . . . Wednesday-Thursday, July 1-2

SECOND SUMMER TERM, 1998

Registration . . . . . Thursday, July 2
Fourth of July (no classes)(University closed) . . . . . Friday, July 3
First class day . . . . . Monday, July 6
Last class day . . . . . Friday, August 7
Final examinations . . . . . Monday-Tuesday, August 10-11

FALL SEMESTER, 1998

Academic year begins . . . . . Sunday, August 16
Orientation, Advising, Registration . . . . . Wednesday-Friday, August 19-21
First class day . . . . . Monday, August 24
Labor Day (no classes)(University closed) . . . . . Monday, September 7
Fall recess (no classes) . . . . . Monday, October 12
Thanksgiving recess (no classes) . . . . . Wednesday-Friday, November 25-27
Last class day . . . . . Friday, December 11
Final examinations . . . . . Saturday, December 12, Monday-Friday, December 14-18
Commencement . . . . . Saturday, December 19

SPRING SEMESTER, 1999

Orientation, Advising, Registration . . . . . Sunday-Tuesday, January 10-12
First class day . . . . . Wednesday, January 13
Martin Luther King Day (no classes)(University closed) . . . . . Monday, January 18
Spring recess (no classes) . . . . . Monday-Friday, March 8-12
Last class day . . . . . Wednesday, May 5
Final examinations . . . . . Thursday-Saturday, May 6-8, Monday-Wednesday May 10-12
Commencement . . . . . Saturday, May 15
Academic year ends . . . . . Saturday, May 15

FIRST SUMMER TERM, 1999

First class day . . . . . Thursday, May 27
Last class day . . . . . Wednesday, June 30
Final examinations . . . . . Thursday-Friday, July 1-2

SECOND SUMMER TERM, 1999

Fourth of July (no classes)(University closed) . . . . . Monday, July 5
First class day . . . . . Tuesday, July 6
Last class day . . . . . Monday, August 9
Final examinations . . . . . Tuesday-Wednesday, August 10-11

Table of Contents

Academic Calendar 2
The University 4
Student Life--Activities, Organizations 7
Admission to the University 11
Financial Information 16
Academic Regulations and Degree Requirements 24
Programs and Degrees Offered 38
Undergraduate Programs
College of Architecture 42
College of Arts and Sciences 44
African-American and African Studies 45
American Studies 45
Art 46
Biology 48
Chemistry 50
Communication Studies 52
Criminal Justice 55
Dance and Theatre 56
English 56
Foreign Languages 58
Geography and Earth Sciences 59
Gerontology 62
History 63
International Studies 64
Mathematics 64
Museum Studies 66
Music 66
Philosophy 67
Physics 68
Political Science 69
Psychology 70
Religious Studies 72
Sociology, Anthropology and Social Work . . . 73
Urban Studies 74
Women's Studies 74
Belk College of Business Administration 76
Accounting 78
Economics 78
Finance and Business Law 80
Individualized Major in Business 81
International Business 82
Management 83
Information&Operations Management 84
Marketing 86
College of Education 88
Counseling, Special Education, and Child Development 88
Educational Administration, Research, and Technology 88
Middle, Secondary, and K-12 Education 88
Reading and Elementary Education 88
William States Lee College of Engineering 96
Civil Engineering 98
Computer Science 100
Electrical Engineering 102
Engineering Technology 103
Mechanical Engineering/Engineering Science . 108
College of Nursing & Health Professions 110
Nursing 110
Health Promotion and Kinesiology 112
Special Programs 114
University Honors 114
Departmental Honors Program 114
International Studies 114
ROTC Programs 116
Experiential Learning Programs 118
Preparation for Professional Schools 118
The Graduate School
History and Organization 121
Admission 123
Academic Regulations and Degree Requirements 126
Master's Degree Requirements 128
Ph.D. Requirements 129
Graduate Certificate Requirements 130
Graduate Programs 131
Accounting, M.ACC. 131
Architecture, M.ARCH. 131
Biology, M.S., M.A. 132
Business Administration, M.B.A., M.B.A. Plus Certificate 133
Chemistry, M.S. 135
Computer Science, M.S. 136
Criminal Justice, M.S. 137
Economics, M.S. 137
Education 138
Elementary Education, M.Ed.. 139
Middle Grades Education, M.Ed. 140
Secondary Education, M.Ed. 140
Special Education, M. Ed. 141
Reading, Language, and Literacy, M.Ed. 143
Teaching English as a Second Language, M.Ed. 144
Instructional Systems Technology, M.Ed. 145
Counseling, M.A. 145
Educational Administration, M.S.A., Ed.D. . . .147
Engineering, M.S.E., M.E. 149
Civil Engineering, M.S.C.E. 149
Electrical Engineering, M.S.E.E, Ph.D. 149
Mechanical Engineering, M.S.M.E., Ph.D. . . .149
English, M.A. 152
Geography, M.A. 154
Gerontology, M.A. 156
Health Administration, M.H.A. 157
History, M.A. 158
Liberal Studies, M.A 159
Mathematics, M.A., M.S., Ph.D. 160
Mathematics Education, M.A. 160
Applied Mathematics, M.S., Ph.D. 161
Applied Statistics, M.S. 162
Nursing, M.S.N. 164
Adult Health Nursing, M.S.N. 164
Nurse Anesthesia, M.S.N. 165
Community Health Nursing,, M.S.N. 165
Family Nurse Practitioner, M.S.N. 165
Adult Psychiatric Mental Health Nursing, M.S.N. 166
Nursing/Health Administration, M.S.N./M.H.A. 166
Health Promotion 167
Operations Research 168
Physics, M.S. 168
Psychology (Clinical/Community), M.A. 169
Psychology (Industrial/Organizational), M.A. . . . 170
Public Administration, M.P.A. 170
Sociology, M.A. 172
Interinstitutional Master's Programs 172
Library Science, M.L.S. 172
Social Work, M.S.W. 172
Interinstitutional Doctoral Program 172
Engineering, Ph.D. 172
Course Descriptions -- AAAS - WMST 174
Facilities and Services 327
University Regulation of Student Conduct 336
Code of Student Academic Integrity 336
Code of Student Responsibility 336
Program to Prevent Use of Illegal Drugs and Alcohol Abuse 337
Immunization Requirements 339
Directory 341
Index 376

THE UNIVERSITY

UNC Charlotte aspires to be North Carolina's most energetic and responsive university, offering unparalleled educational opportunities for students seeking the highest quality undergraduate, graduate, and continuing personal or professional enrichment in the liberal arts and sciences and selected professions. With an enrollment of more than 15,000 students in its academic programs and approximately 4,000 students residing on the campus, UNC Charlotte attracts a diverse student body from 44 states and 65 foreign countries.

The University offers a comprehensive array of baccalaureate and master's programs and selected opportunities for doctoral education designed to serve the educational needs of the citizens of North Carolina. In addition, it has one of the most active international studies programs in the country for an institution of its size. A number of programs, including graduate studies, are offered in the evening, on weekends, and at UNC Charlotte Uptown, a classroom facility in the heart of Charlotte.

UNC Charlotte is known for its "student-centered" approach to education featuring outstanding faculty in classes of moderate size. The University's goal is to help every student capable of completing college-level work to learn to the maximum of their ability and to be successful in their chosen field of study. UNC Charlotte also is gaining national and international recognition for the research and scholarship of its faculty and for its willingness to collaborate with other institutions to address the major educational, economic, social, and cultural needs of the greater Charlotte region.

Despite its location in a metropolitan area of more than 1.5 million people, the campus includes approximately one thousand acres of rolling hills with forests, streams, and ponds, surrounding a pedestrian core of contemporary air-conditioned buildings that has the feel of a small residential campus. Easily accessed by nearby interstate highways and an international airport, the campus is enhanced by University City, a planned community comprising University Place, University Research Park, and University Hospital, adjacent to the campus.

INSTITUTIONAL MISSION STATEMENT

UNC Charlotte is the public university of the Charlotte region, fully engaged in the discovery, dissemination, synthesis, and application of knowledge. It provides for the educational, economic, social, and cultural

advancement of the people of North Carolina through on- and off-campus programs, continuing personal and professional education opportunities, research, and collaborative relationships with the private, public, and nonprofit institutional resources of the greater Charlotte metropolitan region.

The primary commitment of UNC Charlotte is to extend educational opportunities and to ensure success for qualified students of diverse backgrounds through informed and effective teaching in the liberal arts and sciences and in selected professional programs offered through colleges of Architecture, Arts and Sciences, Business Administration, Education, Engineering, and Nursing and Health Professions, and through programs and services designed to support students' intellectual and personal development. The University offers a comprehensive array of baccalaureate and master's programs and selective opportunities for doctoral education.

With a broad institutional commitment to liberal education as the foundation for constructive citizenship, professional practice, and lifelong learning, UNC Charlotte is prepared to focus interdisciplinary resources to address six broad areas of concern to the region comprising the ten North Carolina and three South Carolina counties that surround Charlotte: 1) Business and Finance; 2) Community and Regional Development; 3) Children, Families, and Schools; 4) Health Care and Health Policy; 5) International Understanding and Involvement; and 6) Applied Sciences and Technologies.

GOALS OF UNC CHARLOTTE EDUCATION

Graduates of The University of North Carolina at Charlotte should be self-motivated individuals who are able to form, articulate and act upon reasoned decisions in their personal, civic, and professional lives. To this end they should (a) have a broad knowledge base as well as a more specialized knowledge base in their chosen area, (b) possess skills and capacities that can be applied to a variety of situations and professions in an ever-changing world, (c) understand the complexities and interrelationships between humans and their environment, and (d) possess a realistic understanding of their own potentials, limitations and mental/physical development. All UNC Charlotte graduates should possess a general understanding of and appreciation for science and technology; literature and the arts; the individual, society, and culture; and the interrelationships among these.

In order to meet these goals of UNC Charlotte education, students engage in programs designed to develop understandings, skills and capacities in the following six interrelated major areas:

I. **Communication**
II. **Problem Solving**
III. **Understanding Values**
IV. **Understanding Science and Technology**
V. **Understanding the Arts, Literature and Ideas**
VI. **Understanding the Individual, Society and Culture**

EQUAL OPPORTUNITY AND AFFIRMATIVE ACTION

The University of North Carolina at Charlotte is dedicated to equal opportunity through affirmative action within the University community. The University's affirmative action program is designed to provide equal consideration of all applicants for faculty and staff positions, for all faculty members in the tenure and promotion process, for administrators and other staff members seeking promotions and upgrades, as well as for students seeking admission, financial aid, and equality in academic and athletic programs.

In keeping with this policy, faculty and staff are recruited, hired, and promoted without regard to race, color, religion, sex, national origin, age, sexual orientation, or any non-relevant disability. The University actively recruits students from protected categories and provides opportunities for the growth and development of these students.

The University's Affirmative Action Program was established in 1973 and includes the monitoring and reporting of compliance with applicable laws and regulations including Titles VI and VII of the Civil Rights Act of 1964, as amended; Executive Order 11246, as amended by Executive Order 11375; Revised Order No. 4; the Equal Pay Act of 1963, as amended; the Rehabilitation Act of 1973 as amended; the Vietnam Era Veteran's Rehabilitation Act of 1974; Titles VII and VIII of the Public Health Service Action; Title IX of the Education Amendments of 1972; The Americans with Disabilities Act; and all applicable laws and ordinances of the State of North Carolina. The University has a published Affirmative Action Plan, copies of which have been distributed to all departments and offices. Copies have also been placed on reserve in the Library.

The Director of Human Resources serves as the Affirmative Action Officer and is responsible for ensuring The University's commitments are met. Contact the Director of Human Resources, 225 King Building, (704) 547-4269.

Discriminatory Personal Conduct. The University seeks to promote a fair, humane, and respectful environment for its faculty, staff, and students. To that end, University policy explicitly prohibits sexual harassment, racial harassment, and all other personal conduct which inappropriately asserts that sex, race, ethnicity, sexual orientation, disability, or ancestry are relevant to consideration of individual worth or individual performance. The same policies provide procedures for the informal or formal resolution of instances where such behavior is suspected or alleged. The policies have received wide distribution and are available for inspection in all administrative offices on campus.

ACADEMIC STRUCTURE

UNC Charlotte is organized into four administrative divisions: Academic Affairs, Business Affairs, Development and University Relations, and Student Affairs. The Division of Academic Affairs includes

Academic Programs; Graduate Programs; Library and Information Services; Extended Academic Programs; International Programs; Research; and six colleges, the Colleges of Architecture, Arts and Sciences, Business Administration, Engineering, Education, and Nursing and Health Professions. The colleges offer more than 75 undergraduate and 40 master's degree options and sixth-year Certificate of Advanced Study, and four doctoral programs through the departments and programs listed by college in the *Undergraduate Programs and Graduate Programs* sections of this *Catalog*. Many of the departments throughout The University are involved in teacher education. The College of Education, advised by the University Teacher Education Committee, is responsible for these programs.

ACCREDITATION

UNC Charlotte is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia 30033-4097: telephone number 404-679-4501) to award baccalaureate, master's, intermediate, and doctoral degrees.

The Bachelor of Architecture program is accredited by the National Architectural Accrediting board (NAAB). The Department of Chemistry is on the approval list of the American Chemical Society. The Master of Public Administration program is accredited by the National Association of Schools of Public Affairs and Administration (NASPAA). The Bachelor of Social Work program is accredited by the Council on Social Work Education (CSWE). The programs in business and accounting are accredited by the American Assembly of Collegiate Schools of Business (AACSB). The University's professional education programs for PK-12 teachers, counselors, and administrators are approved by the North Carolina Department of Public Instruction (NCDPI) and accredited by the National Council for Accreditation of Teacher Education (NCATE). The School Counseling and Agency (Community) Counseling programs in Counselor Education are accredited by the Council for Accreditation of Counseling and Related Educational Programs (CACREP). The programs in engineering are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET) and those in engineering technology by the Technology Accreditation Commission of ABET. The Nursing programs are accredited by the National League for Nursing (NLN) and approved by the North Carolina Board of Nursing. The Nursing Anesthesia program is accredited by the Council on Accreditation of Nursing Anesthesia Educational Programs (CANAEP).

The University is a member of the Council of Graduate Schools, the Conference of Southern Graduate Schools, and The North Carolina Association of Colleges and Universities.

STUDENT LIFE

ACTIVITIES

Students at UNC Charlotte are encouraged to participate in extracurricular activities. The Student Government Association, the University Program Board, and campus publications are a few of the available activities which can play a significant role in each student's development and total education. Participation in activities, ranging in type from service and religious to athletic and social, and from creative arts and crafts to wilderness experiences, increases a student's opportunities to acquire leadership skills, to experience the responsibilities involved in functioning within a self-governmental process, and to develop personal talents and interests.

Students are in good standing and eligible for participation in student activities as long as they are academically eligible to continue their enrollment.

Athletics. The UNC Charlotte Department of Athletics provides competition in 16 intercollegiate varsity sports for men and women. Each sport competes under the governing powers of the National Collegiate Athletic Association (NCAA) at the Division I level, which is the highest competitive level for collegiate varsity sports. Scholarships are available for all varsity sports, male and female.

Male student-athletes compete in eight sports: baseball, basketball, cross-country, golf, soccer, tennis, indoor track and field, and outdoor track and field. Female student-athletes also compete in eight sports: basketball, cross-country, soccer, softball, tennis, volleyball, indoor track and field, and outdoor track and field.

UNC Charlotte is a member of Conference USA, which sponsors championships in 15 of the 49ers' 16 sports and softball competes in the Southern Atlantic Alliance. Conference USA is made up of 12 schools from 12 states: The University of Alabama at Birmingham, The University of Cincinnati, DePaul University, The University of Houston, The University of Louisville, Marquette University, The University of Memphis, Saint Louis University, The University of South Florida, The University of Southern Mississippi, Tulane University, and UNC Charlotte. Conference USA tournament champions in baseball, basketball, men's soccer, and volleyball receive automatic bids to the NCAA post-season tournament.

In the decade of the 90's, the 49ers baseball, men's basketball and men's soccer teams have all participated in NCAA tournament play. In addition, individuals from women's cross-country, men's golf, and women's track and field have qualified for NCAA championship competition.

Intramural and Recreational Services are offered in a comprehensive program to provide enjoyable recreational opportunities for UNC Charlotte. The program includes team, dual and individual intramural sports for men and women, and ample opportunities for unstructured "free play" activities. In addition, there are 14 active sports clubs and a diverse schedule of fitness classes available to the entire University community.

Belk gymnasium features basketball, volleyball and badminton courts, a swimming pool, racquetball courts, weight room, and lockers for students, faculty and staff. It also houses classrooms and an auditorium for audiovisual presentations.

The James H. Barnhardt Student Activity Center is a multi-purpose facility designed to meet the diverse social, cultural, and recreational needs of students at UNC Charlotte. The 9100 seat arena is a first-class setting for athletic events as well as conferences, lectures, and entertainment activities. Recreational opportunities are available daily in the two weight rooms, aerobics studio, indoor track, four indoor basketball/volleyball courts, and the indoor climbing wall. While physical fitness opportunities can be enjoyed in these areas, two other areas of the building emphasize relaxation and socializing. The first floor is home to a spacious food court. Overlooking the food court on the second floor is a 7000 square foot game room. Billiard tables, table tennis, pin ball, computer games, and card tables are available for an array of gaming activities. A hospitality room that can be sub-divided into five separate meeting salons located on the top floor is available to University organizations.

Venture offers experiential learning, non-credit courses and workshops in outdoor settings. Activities include weekend trips in a variety of outdoor sports from backpacking to kayaking, and programs at our on-campus team building course and high ropes challenge course. Venture programs are modeled on Outward Bound and are designed to facilitate individual growth through physical challenge, group interaction, and personal reflection. VOLTAGE (Venture Outdoor Leadership Training and Group Experience) trains student leaders to instruct Venture Programs. Venture houses a resource library to help individuals plan their own trips. Outdoor camping gear can be rented.

Venture also offers courses for academic credit through the Department of Health Promotion and Kinesiology. Each fall, a three-credit course, Wilderness Experience, offers an adapted Outward Bound experience presenting a series of increasing challenges. A variety of one-credit outdoor activity courses also is offered. For additional details, see the descriptions for physical education (PHED) courses or contact the Venture Program (547-2486) in the Cone University Center.

The Student Body Government provides students an early experience in governmental affairs. Students often find their work in student government a useful background for later public service. The University encourages student participation in its affairs and has student representatives on many of the faculty and administrative committees. The leaders of student government are committed to representing the student body and to developing students' awareness of the many facets of life at their University. All regularly enrolled students, whether on a part- or full-time basis, are eligible to participate in student government.

Student Body Government comprises:

The Executive Branch, made up of the president, the vice president, the cabinet, the Student Court Officers, and committees appointed by the president.

The Student Legislature, composed of the chair, the four class presidents, the residence hall representatives, commuter student representatives, representatives from each college chosen by the students majoring in the college, and non-traditional and graduate student representatives. The chair of the Student Legislature conducts all meetings and serves as liaison between the Legislature and the president's office. The student body treasurer reports to the Student Legislature.

The Student Judiciary, composed of panel members of the Student Court, Case Advocate, and the student defense, is responsible for dealing with cases of alleged violations of the UNC Charlotte Code of Student Responsibility and for interpreting the Student Body Constitution.

The Student Leadership Development Program provides individuals with opportunities to develop leadership skills and abilities and the University and student organizations with potentially more effective and efficient leaders. The goal is to provide a comprehensive and diverse program of leadership development activities for student leaders and potential leaders.

The program consists of five major components each designed for a target group of campus leaders, members of their organizations or potential leaders of campus organizations.

Leadership Transition Retreat--For established leaders
Leadership Resource Area--Information on a variety of leadership topics for individuals and organizations
Emerging Leaders--For freshmen
Leadership Theory and the Dynamics of Group Process--A 3-hour course in Communication Studies
Individual and Group Consultation--Co-sponsorship of leadership conferences for Greeks, women, and African-American students.

Contact the Office of Student Activities for more information, 547-2521.

Media Board. As the governing body for Student Media, the board may set policies and procedures and may determine operational restrictions. Five at-large members and three media representatives are elected each spring by the student body. Interested students should see the media adviser in early spring. *For information: Phone* 547-2663.

The University Times. Serving the University community, *The Times* is distributed free to both on- and off-campus locations, bringing news, events, sports, and features of importance to UNC Charlotte and the surrounding community. It is not necessary to be an English major or to have prior experience, just the motivation to be involved. *For more information:* 547-2324.

Media Marketing is the advertising branch of Student Media responsible for contracting and sales of advertising for all student publications, generating campus promotions, special inserts and sections of *The Times,* as well as soliciting contributions for Student Media fund-raising efforts, circulation, and subscriptions.

There is no need to be a business or marketing major; a desire to make the program an exciting and successful one is all that is necessary. *For information: Phone* 547-2160.

Sanskrit Literary-Arts Publication, UNC Charlotte's literary-arts magazine, publishes both student and non-student work in four categories: art, photography, short fiction, and poetry. *Sanskrit* is an excellent vehicle for exposure of student talent and creative efforts. Submissions are encouraged and are due in the fall. Guidelines for submitting material and deadline information are available through the Student Media Offices in Cone Center. *For information: Phone* 547-2326.

NinerVideo is UNC Charlotte's newest branch of Student Media and captures on video the sights, sounds and experiences that make the University a truly special place. Students can purchase the annual video as a moving pictorial history of their years at UNC Charlotte.

The NinerVideo provides students with the opportunity to gain broadcasting-related media exposure while providing valuable skills in editing, production, and writing. *For information: Phone* 547-2702.

The University Program Board is a student-operated organization that plans and promotes social, cultural, educational, and recreational programs for students and the University community. These programs include concerts, coffeehouse entertainment, homecoming, lectures, fine arts, films, Jazzing, minority programs, Friday night events, and other special activities.

The Program Board consists of a chairperson, vice chairperson, assistant, treasurer, and ten committee directors. The chairperson, vice chairperson and two at-large positions are elected in the annual campus-wide spring elections. Directors are selected by an application and interview process during spring semester.

Black Student Union is an organization designed to address issues facing the African-American student community. The activities it sponsors include the annual Halloween Carnival, the Fall and Spring Step Shows, the Housekeeper's Appreciation Day, and an annual Awards Banquet. This organization also produces a student-run publication "The Black Perspective" for the articulation of the voices of African-American students. Students interested in these types of events should contact the BSU office at 547-2191.

BOND (Brothers of Nubian Descent) is a group designed to address the concerns of today's African-American male. This group meets and shares dialogue about networking, global understanding, current events, and the myths and stereotypes associated with his existence in American society. Students interested in these types of events should contact the Office of Student Activities at 547-2521.

Martin Luther King Celebration Committee is a committee of students, faculty and staff working together to produce a campus-wide celebration. For information, contact the Office of Student Activities at 547-2521.

STUDENT ORGANIZATIONS

The University has many clubs and organizations which help meet the academic, social, political, and religious needs of UNC Charlotte students. Contact the Student Government Office, 547-4606, or the Dean of Students Office, 547-2375, for a listing of the clubs and organizations chartered by the Student Government Association.

HONORARIES

The following is a list of national/international honor societies which have chapters at UNC Charlotte to recognize achievement in the disciplines indicated. Further information on each organization is available from the department or college offering the discipline.

Alpha Delta Mu, national social work honor society
Alpha Kappa Delta, national sociology honor society
Alpha Phi Sigma, national honor society for the criminal justice sciences
Beta Alpha Psi, national accounting honor society
Beta, Beta, Beta, national biology honor society
Beta Gamma Sigma, national honor society in business and management
Chi Epsilon, national civil engineering honor society
Chi Sigma Iota, international honor society for counselors
Eta Kappa Nu, national electrical engineering honor society
Gamma Theta Upsilon, international geography honor society
Golden Key, national honor society (all disciplines). Contact: Vice Chancellor for Student Affairs
Kappa Delta Pi, international honor society in education
Omicron Delta Kappa, national leadership honorary. Contact: Vice Chancellor for Student Affairs
Phi Alpha Theta, international history honor society
Phi Eta Sigma, national honor society for freshmen. Contact: Dean of Students Office
Phi Kappa Phi, national honor society (all disciplines). Contact: Office of Academic Affairs
Phi Alpha Alpha, national public affairs/public administration honor society (for graduate students)
Phi Beta Delta, national honor society for international scholars. Contact Office of International Programs.
Phi Sigma Tau, international philosophy honor society
Pi Mu Epsilon, national mathematics honor society
Pi Sigma Alpha, national political science honor society
Psi Chi, national psychology honor society
Sigma Gamma Epsilon, national earth sciences honor society
Sigma Pi Sigma, national physics honor society
Sigma Tau Delta, national English honor society
Sigma Theta Tau, international nursing honor society
Tau Alpha Pi, national engineering technology honor society
Tau Beta Pi, national engineering honor society

OFFICE OF RELIGIOUS AFFAIRS

As a tax-supported public institution, UNC Charlotte neither promotes nor recommends any religious orientation. However,

the University recognizes that spiritual discernment and moral appreciation are essential to the development of the whole personality and has established an Office of Religious Affairs headed by a director.

The functions of this office include providing information to the campus community and general public about religious activities and programming as well as coordinating the activities of religious organizations in the University. These organizations provide a variety of services including prayer, pastoral and academic counseling, retreats, Bible study, marriage preparation, discussion groups, ecumenical activities, and social services. Faculty members, staff and students may obtain additional information by contacting the Office of Religious Affairs.

The religious associations listed below provide the services of their representatives to serve the spiritual needs of students and other members of the campus community.

Don Rogers - Baptist
Barbara Neff Hutchison - Catholic
Lou Ann Sellers - United Christian Fellowship (Lutheran/Methodist/Presbyterian)
Ida Johnson - Episcopal
Susan Austin - Intervarsity
Dan McClintock - Baptist International Coordinator

These persons and other representatives may be reached through the Office of Religious Affairs, 200 King Building, 547-2344.

Student Conduct

All UNC Charlotte students are obligated to be familiar with The University of North Carolina at Charlotte Code of Student Academic Integrity, Code of Student Responsibility, and all University policies governing student conduct (see the *University Regulation of Student Conduct* section of this Catalog). Copies of these documents have been distributed to students. Any student who needs a copy of these documents may obtain one at the Office of the Dean of Students. The University reserves the right to amend its codes from time to time. Notice of amendments will be publicized.

ADMISSION TO THE UNIVERSITY

The University considers applications for admission without regard to race, color, national origin, religion, sex, sexual orientation, age, or disability. It reserves the right to withhold the admission of applicants who fail to meet any of the requirements for admission and to restrict enrollments as required by budgetary or other constraints.

Admissions Process. Applications for admission are reviewed when all required credentials are received. The review focuses on the academic history of the applicant and considers all relevant factors. The intent of the University is to offer admission to applicants whose credentials indicate a strong likelihood for success in their selected curricula. It is not always possible to accommodate all the applicants who meet the minimum criteria, and some programs select the best qualified from those meeting the minimum requirements. The Admissions Advisory Committee may make exceptions to the minimum criteria for applicants who are judged to have potential or talent not revealed by test scores and academic performance. Notification of the admissions decision is mailed as soon as the decision is made. For programs that have a special admissions process, such as Architecture and Nursing, notification will be later than for other programs.

Students planning to live on campus who indicate their interest in housing on the application for admission will receive a housing contract with their notification of admission. To reserve a housing space, the student completes the application card included in the contract booklet and returns it with the required housing deposit. Early application guarantees early confirmation of housing and enhances the possibility of assignment, if requested, to one of the special lifestyles housing units which are available on a limited basis.

Application forms and information about undergraduate programs are available from:

Office of Undergraduate Admissions
University of North Carolina at Charlotte
9201 University City Boulevard
Charlotte, North Carolina 28223-0001
Telephone: (704) 547-2213

WHEN TO APPLY

Applicants are advised to file their applications for admission well in advance of the schedule below which is based on the amount of time generally required to process an application and inform the applicant of the admission decision. **Early application is especially advantageous during periods of rapid enrollment growth and for programs with limits on the number of new students that can be accepted.**

Term of Entry	Application Should Be Filed By	Application Should Be Completed By
First Summer Term	May 1	May 15
Second Summer Term	June 1	June 15
Fall Semester	July 1	July 15
Spring Semester	November 15	December 1

The University may alter the dates for acceptance of applications without further notice in accordance with available resources and the enrollment limitation established by the North Carolina General Assembly.

THE APPLICATION

The applicant is responsible for supplying all required credentials. Nondisclosure of an applicant's complete academic history will result in rejection of the application and immediate dismissal from the University.

For Freshman Admission, the application includes:

1. A completed *Application for Undergraduate Admission* form.
2. Application fee of $35 (nonrefundable and not deductible).
3. Official high school transcript showing rank in class, GPA computed on a 4.0 scale, senior courses in progress, and SAT or ACT scores. (A high school equivalency certificate or G.E.D. may be submitted in lieu of a high school diploma.)
4. Official Scholastic Assessment Test (SAT) and/or American College Testing Program (ACT) scores.
5. Additional credentials, specified below, for international applications.

For Transfer Admission, the application includes:

1. A completed *Application for Undergraduate Admission* form.
2. Application fee of $35 (nonrefundable and not deductible).
3. Official high school transcript. (This may be waived for applicants who present the A.A., A.S., or A.F.A. degree.)
4. Two official transcripts from every college attended, including summer sessions.
5. Additional credentials, specified below, for international applications.

For Admission of International Applicants, the application also includes:

1. Official scores on the Test of English as a Foreign Language or the Michigan English Language Assessment Battery (M.E.L.A.B), if the applicant is from a non-English speaking country.
2. A Certificate of Financial Responsibility showing the applicant's financial resources while in the United States.

ADMISSION REQUIREMENTS

Freshman Admission Requirements. Candidates for admission to freshman standing, including transfer applicants who present fewer than 24 hours of transferred credit, must:

1. Submit a completed application for admission.
2. Have graduated from an approved or accredited high school or have earned a high school equivalency certificate or G.E.D.
3. Present the following **High School Course Units**: 4 units in *English*, emphasizing grammar, composition and literature; 3 units in *mathematics*, including Algebra I, Algebra II and geometry, or a higher level mathematics course for which Algebra II is a prerequisite; 2 units in *social studies*, including one unit in U.S. history; and 3 units in *science*, including at least one unit in a life or biological science (for example, biology), at least one unit in a physical science (for example, physical science, chemistry, physics), and at least one laboratory course; and 2 units in one *foreign language*. It is *recommended* that the candidate for admission also complete one unit of world history and one-half unit of health education and that one unit of foreign language and one unit of mathematics be completed in the twelfth grade. **Enrollment in the recommended units, the difficulty of courses selected, and the academic courses taken in the twelfth grade will be considered in the admissions decision.** (Course units as defined in these requirements may include high school level courses taken and passed after graduating from high school as well as those taken while enrolled as a high school student.)
4. Present a satisfactory combination of high school grades and SAT or ACT scores as indicated by the predicted college grade index (PGI) calculated by UNC Charlotte. (The PGI is a combination of test scores and the high school grade average in selected academic courses (English, mathematics, sciences, foreign languages, and history) in which an adjustment is made to recognize participation in Honors, AP, and IB courses).
5. Request official Advanced Placement (AP) test results to be sent directly to the Office of Undergraduate Admissions (Code 5105) if advanced placement course credit is to be considered for addition to the UNC Charlotte transcript.
6. Satisfy any additional requirements for acceptance into their chosen major (if any).
7. Present evidence of good physical and mental health and verification of specific immunizations required by North Carolina state law described elsewhere in this *Catalog*. (A *Report of Medical History* form provided with the notification of admission may be used for this purpose.)

Early (Freshman) Admission Requirements. Candidates for early admission to freshman standing must:

1. Have completed the eleventh grade (achieved bona fide senior status as defined by their school systems).
2. Demonstrate outstanding ability in their overall academic performance.
3. Be recommended for early admission by their high school principal.
4. Satisfy the other requirements for admission to freshman standing.

Transfer Admission Requirements. Candidates for admission as transfer students must:

1. Submit a completed application for admission.
2. Satisfy the requirements for freshman admission if they do not present at least 24 hours of transferred credit accepted by UNC Charlotte.
3. Present the **High School Course Units** specified in the Freshman Admission Requirements. ***Transfer applicants*** who did not complete the required course units in high school may earn an Associate in Arts, Associate in Science, or Associate in Fine Arts degree **OR** complete six semester hours (or 9 quarter hours) that are transferable to UNC Charlotte in each of the following subject areas: Mathematics, English, social science, and natural science.
4. Present an academic average of at least C (a grade point average of at least 2.0 on a 4.0 scale) on all post-secondary courses attempted.

5. Be in good standing at the last college or university attended.
6. Satisfy any additional requirements for acceptance into their chosen major (if any).
7. Present evidence of good physical and mental health and verification of specific immunizations required by North Carolina state law described elsewhere in this *Catalog*. (A *Report of Medical History* form provided with the notification of admission may be used for this purpose.)

ADDITIONAL REQUIREMENTS FOR ACCEPTANCE INTO SPECIFIED PROGRAMS

Accounting. *Freshmen* must present a PGI of at least 2.2. *Transfers* must present a GPA of at least 2.75 in the following 10 courses or the portion they have completed: ENGL 1101 and 1102; MATH 1100, 1120; STAT 1220; INFO 2130; ECON 1201 and 1202; and ACCT 2121 and 2122. Transfers who have not completed all 10 courses also must present an overall GPA of at least 2.5. A GPA of at least 2.75 in the 10 courses is required to enroll in junior level accounting courses beginning with ACCT 3138.

Architecture. Applications for the fall semester are accepted through January 31 each year. *Freshmen and transfers* must present algebra, trigonometry, plane and solid geometry, or the equivalent in integrated courses from high school or college; a personal interview and letter of intent are required.

Art. *Freshmen and transfers* seeking admission to the B.F.A. degree program must present an art portfolio and have a personal interview. Students unable to present a portfolio at the time of admission may be admitted to the B.A. degree program in Art. Instructions for preparation of the portfolio and scheduling the interview are available from the Office of Undergraduate Admissions. Admitted students seeking a change of major into the B.F.A. program should contact the Art Department for information.

Business Administration (B.S.B.A. degree programs). *Freshmen* must present a PGI of at least 2.1 to be admitted to the College. *Transfers* may be admitted either to Prebusiness or to an upper division major as follows. To be accepted into an upper division major, transfers must have: (1) junior standing; (2) completed ACCT 2121 and 2122, ECON 1201 and 1202, MATH 1120, and STAT 1220 with at least a "C" in each course; and (3) a GPA of at least 2.0 on all previous college work. These students must pass the College Microcomputer Proficiency Test during their first semester to be eligible to enroll in upper division courses in the College. Transfers who do not qualify for acceptance into an upper division major may be admitted to the lower division Prebusiness program. Those who transfer fewer than 24 hours must meet the criteria for admission of freshmen and present a GPA of at least 2.0. Those who transfer at least 24 hours must have a GPA of at least 2.0 in all college work and have a "C" or better in all the following courses attempted: MATH 1120; STAT 1220; ACCT 2121, 2122; and ECON 1201, 1202.

Computer Science. *Freshmen* must present a PGI of at least 2.5. *Transfers* must present an overall GPA of at least 2.5 with no grade less than C in computer science courses.

Economics. *Transfers* from other institutions must present a 2.0 GPA overall and in the following 8 courses: ENGL 1101 and 1102; MATH 1100 and 1120; STAT 1220; INFO 2130; and ECON 1201 and 1202.

Education. *Freshmen* interested in teacher education may be classified as Pre-Education students and should declare their interest to receive appropriate advising services. Admission to a Teacher Education program typically occurs at the end of the sophomore year and requires (1) a GPA of at least 2.5 in courses taken and/or accepted on transfer by UNC Charlotte; (2) a grade of C or better in both EDUC 2100 and SPED 2100; and (3) test scores at or above North Carolina Department of Public Instruction (NCDPI) cut-score levels on Praxis I: Pre-Professional Skills Tests in Reading, Mathematics, and Writing. *Transfers* must meet the same requirements.

Engineering. Freshmen must present acceptable grades in algebra, trigonometry, plane geometry or the equivalent in integrated courses. Those presenting SAT MATH scores > 520 and a PGI > 2.5 may be admitted directly to the lower division of a department. (The lower division encompasses the first two years of *Catalog*-specified courses in a department). Students not admitted to the lower division in a department presenting SAT MATH scores > 480 will be considered for admission to the Freshman Engineering Program. *Transfers* must present a GPA of at least 2.5 and meet the same mathematics requirements as engineering freshmen using either high school or college mathematics courses. All transfers will be admitted to the lower division of a department, and evaluation of transfer credits to a program by the department chair will follow the guidelines of the North Carolina Engineering Transfer Board. Transfers from an ABET accredited engineering program who do not have a 2.5 GPA may be admitted upon the recommendation of the chair of the major department.

Engineering Technology. *Transfers* only are accepted into this program. They must: (1) Have an Associate in Applied Science degree, or its equivalent, in a field appropriate to the option they plan to enter; (2) Have an overall GPA of at least 2.2 (2.5 for entry into the Manufacturing Engineering Technology track) on all courses taken toward the two-year degree. (Exceptions to this requirement will be considered on the basis of individual merit.); and (3) Complete satisfactorily the prerequisite background courses for the option they plan to enter. Acceptance of the A.A.S. degree indicates the acceptance of up to 64 hours toward the Bachelor of Science in Engineering Technology degree only. These hours are not valid toward any other degree program at the University.

Music. An audition is required and will be scheduled by the Music Department after it is determined that the applicant is qualified for admission to the University.

Nursing. Applicants are admitted to the Nursing major at the upper division or junior year only. *Freshmen* who meet university requirements may be admitted to Pre-Nursing. Acceptance into Pre-Nursing does not automatically qualify an applicant for acceptance into the upper division nursing major. *Trnasfers* who have an overall GPA of at least 2.5 but have not completed all prerequisites may be admitted into Pre-Nursing; however, this does not automatically qualify the applicant for acceptance into the

upper-division Nursing major. Admission to the upper division Nursing major is competitive and not all applicants can be accommodated. Only the best qualified applicants are accepted for the limited spaces available. Applications for the upper division B.S.N. major must be received in the Office of Undergraduate Admissions, , including all supporting documentation and transcripts, by January 15 in order to be considered for admission into the fall semester. Applicants are admitted into the upper division major in the fall semester only.

Transfer students who hold a current license as a registered nurse (RN) in North Carolina are eligible to apply for the RN/BSN completion program. Students who have an overall GPA of at least 2.5 but have not completed all prerequisites may be admitted into the Pre-RN/BSN program. Admission into the upper division RN/BSN program is competitive. Applications for the upper division RN/BSN program, along with all required transcripts, must be received in the Office of Undergraduate Admissions by March 15 to be considered for the fall semester and by October 1 to be considered for the spring semester.

NEW STUDENT ORIENTATION/REGISTRATION

New students are encouraged to participate in one of the **Student Orientation, Advising, and Registration (SOAR)** sessions scheduled in June and at the beginning of each semester. Separate programs are offered for Freshmen, and their parents, and for Transfers. Activities include academic advising; placement tests in mathematics, and foreign language proficiency tests; introduction to academic support services, student organizations, and campus life; and registration for classes. Placement and proficiency examinations are given to determine the appropriate courses for all new students to take in **mathematics** and **foreign language** and for non-native speakers of English to take in **English.**

Foreign Language Proficiency Procedures. Freshmen and transfers are required to pass or place out of the third college level course (e.g., French 1102) in a language studied for at least two years in high school, or to pass the second college level course in a new language not studied for two years in high school. Students who plan to continue study of the language taken in high school must take a UNC Charlotte Foreign Language Proficiency Exam. Proficiency examinations are offered in French, German, Italian, Latin, and Spanish during SOAR. Contact the Department of Foreign Languages or Academic Assessment Services for additional information.

Mathematics Placement Procedures. Freshmen and Transfers who have not completed all Mathematics courses required for their program of study must take a placement examination to determine the appropriate entry-level Mathematics course for them. *All students entering the College of Engineering must take this placement examination.* Contact the Mathematics Department for additional information.

English Placement Procedures for Non-Native Speakers of English. All undergraduate students who are not native speakers of English are required to take the UNC Charlotte English Placement Test to determine whether they must enroll in ENGL 1100 (English for International Students) or ENGL 1101 (English Composition). The test must be taken at the beginning of their first semester at UNC Charlotte. To receive transferred credits equivalent to ENGL 1101/1102, non-native speakers of English must first pass the placement test or successfully complete ENGL 1100. Contact the English Department or the Office of International Programs for additional information.

READMISSION OF FORMER STUDENTS

A student who has been suspended or has not attended UNC Charlotte for 24 consecutive months must make application for readmission to the University prior to the semester or summer term for which registration is sought. Application should be filed at the Undergraduate Admissions Office in accordance with the published dates.

Former students who left the University in good standing AND who plan to return in less than 24 months, may contact the Registrar's office and complete a brief enrollment form in order to register. Such students must meet the GPA and departmental progression requirements of the major in which they will return. Official transcripts from any institution attended during the student's absence from the University must be submitted prior to enrollment.

For information on readmission after suspension for academic reasons, see the *Academic Regulations* section of this *Catalog*.

A.A. Degree Rule. Students who leave UNC Charlotte and subsequently earn an Associate of Arts (A.A.) degree may apply for admission as transfer students, and transfer a maximum of 64 semester hours, including hours from UNC Charlotte or other four-year institutions *applied to the A.A. degree*. Students may be readmitted one time under either this A.A. Degree Rule or the Two-Year Rule but not both.

Two-Year Rule for Undergraduate Students. Any undergraduate student who has not been enrolled at UNC Charlotte for a minimum period of 24 consecutive months is eligible for *one* readmission under the "Two-Year Rule." Students may be readmitted one time under either the A.A. Rule or the Two-Year Rule but not both. The Two-Year Rule will be applied automatically if the student is eligible. (Students electing not to have it applied may exercise this option by filing a form with the Registrar after consulting with their adviser.) Colleges and departments which have published admission or continued enrollment standards that are more restrictive than general University requirements retain the right to admit or to deny admission to a specific program.

If a student is readmitted under the provisions of the two-year rule, then only those courses for which the student has received a grade of *C* or better (or *H* or *P*) can be used for academic credit. His or her grade point average will be based only on the courses that return with them and the work attempted after readmission. Eligibility for continued enrollment is determined as in the case of transfer students.

To qualify for graduation with honors, a student must have a grade point average computed on at least 48 hours

taken in residence on which the UNC Charlotte GPA is based.

Second Baccalaureate Major/Additional Minor. Students who have earned a bachelor's degree from UNC Charlotte may apply for readmission into a program leading to a second major or to an additional minor. See requirements which follow.

ADMISSION FOR SECOND BACCALAUREATE DEGREE

Students who have earned bachelor's degrees from UNC Charlotte or other accredited institutions may apply for admission to a program leading to a second degree of the same level if the following requirements are met:

1. Application in writing must be made to the Undergraduate Admissions Office in accordance with the published application dates.
2. The major field selected must be different from that of the first degree.
3. The degree sought must be different from the first when that degree was granted by UNC Charlotte.
4. Applicant must meet the requirements for acceptance into the selected field.

OTHERS ELIGIBLE FOR ADMISSION

Adult Students Admission Program (ASAP). Adult students 25 years of age or older who have been out of school for five or more years and present appropriate educational credentials are encouraged to make application through the Undergraduate Admissions Office. This unique program offers adults the opportunity for special admissions status, an academic adviser through the Office of Adult Students and Evening Services (OASES), and adult transitional support services throughout the first two years of their enrollment. Students who declare a major are advised through their major department.

Escrow Program Participants. The Escrow Program provides an opportunity for highly qualified students to take college credit courses while enrolled in secondary school. Records of credit earned will be maintained for use at the University or at another institution of higher learning.

Applicants recommended for participation in the program usually have shown great ability in particular academic areas. The recommendations are normally made by the secondary school principal.

Requests for additional information and application forms should be directed to the Office of Undergraduate Admissions at UNC Charlotte.

Senior Citizens. Residents of North Carolina who have attained the age of 65 and who meet applicable admission standards may enroll tuition-free on a space-available basis. Senior citizens are obligated to pay any special fees or service charges which are assessed all students. Interested persons should contact the Office of Undergraduate Admissions.

Non-degree Students. Non-degree students are those who are not seeking a degree at UNC Charlotte. If space is available, they may enroll in undergraduate courses at the University until they have attempted a total of 18 semester hours with grade evaluation. Regular degree students will have preference for places in classes. Non-degree students are expected to conform to the standards required of all students. After reaching the 18-hour limitation, non-degree students must be reviewed and be acceptable for regular degree status before continuing at the University.

Non-degree students who have done previous college work (including UNC Charlotte) must be eligible to return to the institution last attended.

The student must be 18 years of age or over and must understand at the time of his/her registration that the work completed in non-degree student status will be evaluated in terms of major department and degree requirements only after the student's formal admission to a degree program.

Visiting Students. Students enrolled at other colleges and universities who have written permission from their institutions to take specified courses at the University in a given semester or term may be admitted as visiting students. They register on a space available basis after UNC Charlotte degree seeking students.

FINANCIAL INFORMATION

STUDENT EXPENSES AND FEE PAYMENT

Charges for tuition and fees vary according to the student's status as a resident or nonresident of North Carolina. A nonresident student pays a higher rate of tuition than a legal resident.

The University reserves the right, with the approval of proper authorities, to make changes in tuition and fees at any time.

Student Expenses. Graduate students taking nine or more semester hours and undergraduate students taking 12 or more semester hours during a regular semester will be charged full tuition and fees. Students taking fewer than the nine hours for graduates and 12 hours for undergraduates will be charged a prorated portion of tuition and fees as specified in the fee schedules in this *Catalog*.

Costs of tuition and fees for the regular academic year for a typical full-time North Carolina student are $1,718 and for a typical out-of-state student, $8,872. Cost of housing and dining for the academic year are $3,386 to $4,018, depending on the options chosen.

The estimated average cost of books and supplies per semester varies by area and level of study and ranges from $225 to $300. Beginning students in architecture and engineering should allow an additional expense of $200 to $300 for drawing instruments, calculator and supplies. Uniforms and supplies for nurses cost approximately $300.

In addition to the above, the student should take into consideration the cost of clothing, snacks, recreation, laundry, transportation, etc., in planning his/her expenses for each semester.

Fee Payment. Tuition and fees are due and payable by the date specified on the bill. Advance registration billing and due dates of fees vary with the term. Checks and money orders should be made payable to UNC Charlotte. Visa and MasterCard are accepted.

Returned Check Policy. If a check is returned by the bank, a certified letter is sent to the maker, indicating that a penalty of $15 has been assessed and the account must be settled within 10 working days or the check will be considered to be a bad check and be processed accordingly. A hold will be placed on the student's record until the bad check is covered and the penalty is paid.

RESIDENCE STATUS FOR TUITION PURPOSES

The basis for determining the appropriate tuition charge rests upon whether a student is a resident or a nonresident for tuition purposes. Each student must make a statement as to the length of his or her residence in North Carolina, with assessment by the institution of that statement to be conditioned by the following:

Residence. To qualify as a resident for tuition purposes, a person must become a legal resident and remain a legal resident for at least 12 months immediately prior to classification. Thus, there is a distinction between legal residence and residence for tuition purposes. Furthermore, 12 months' legal residence means more than simple abode

in North Carolina. In particular it means maintaining a domicile (permanent home of indefinite duration) as opposed to "maintaining a mere temporary residence or abode incident to enrollment in an institution of higher education." The burden of establishing facts which justify classification of a student as a resident entitled to in-state tuition rates is on the applicant for such classification, who must show his or her entitlement by the preponderance (the greater part) of the residentiary information.

Initiative. Being classified a resident for tuition purposes is contingent on the student's seeking such status and providing all information that the institution may require in making the determination.

Parents' Domicile. If an individual, irrespective of age, has living parent(s) or court-appointed guardian of the person, the domicile of such parent(s) or guardian is, prima facie, the domicile of the individual; **but this prima facie evidence of the individual's domicile may or may not be sustained by other information.** Further, nondomiciliary status of parents is not deemed prima facie evidence of the applicant child's status if the applicant has lived (though not necessarily legally resided) in North Carolina for the five years preceding enrollment or re-registration.

Effect of Marriage. Marriage alone does not prevent a person from becoming or continuing to be a resident for tuition purposes, nor does marriage in any circumstance insure that a person will become or continue to be a resident for tuition purposes. Marriage and the legal residence of one's spouse are, however, relevant information in determining residentiary intent. Furthermore, if both a husband and his wife are legal residents of North Carolina and if one of them has been a legal resident longer than the other, then the longer duration may be claimed by either spouse in meeting the 12-month requirement for in-state tuition status.

Military Personnel. A North Carolinian who serves outside the State in the armed forces does not lose North Carolina domicile simply by reason of such service. And students from the military may prove retention or establishment of residence by reference, as in other cases, to residentiary acts accompanied by residentiary intent.

In addition, a separate North Carolina statute affords tuition rate benefits to certain military personnel and their dependents even though not qualifying for the in-state tuition rate by reason of 12 months legal residence in North Carolina. Members of the armed services, while stationed in and concurrently living in North Carolina, may be charged a tuition rate lower than the out-of-state tuition rate to the extent that the total of entitlements for applicable tuition costs available from the federal government, plus certain amounts based under a statutory formula upon the in-state tuition rate, is a sum less than the out-of-state tuition rate for the pertinent enrollment. A dependent relative of a service member stationed in North Carolina is eligible to be charged the in-state tuition rate while the dependent relative is living in North Carolina with the service member and if the dependent relative has met any requirement of the Selective Service System applicable to the dependent relative. These tuition benefits may be enjoyed only if the applicable requirements for admission have been met; these benefits alone do not provide the basis for receiving those derivative benefits under the provisions of the residence classification statute reviewed elsewhere in this summary.

Grace Period. If a person (1) has been a bona fide legal resident, (2) has consequently been classified a resident for tuition purposes, and (3) has subsequently lost North Carolina legal residence while enrolled at a public institution of higher education, that person may continue to enjoy the in-state tuition rate for a grace period of 12 months measured from the date on which North Carolina legal residence was lost. If the 12 months ends during an academic term for which the person is enrolled at a State institution of higher education, the grace period extends, in addition, to the end of that term. The fact of marriage to one who continues domiciled outside North Carolina does not by itself cause loss of legal residence, marking the beginning of the grace period.

Minors. Minors (persons under 18 years of age) usually have the domicile of their parents, but certain special cases are recognized by the residence classification statute in determining residence for tuition purposes.

(a) If a minor's parents live apart, the minor's domicile is deemed to be North Carolina for the time period(s) that either parent, as a North Carolina legal resident, may claim and does claim the minor as a tax dependent, even if other law or judicial act assigns the minor's domicile outside North Carolina. A minor thus deemed to be a legal resident will not, upon achieving majority before enrolling at an institution of higher education, lose North Carolina legal residence if that person (1) upon becoming an adult "acts, to the extent that the person's degree of actual emancipation permits, in a manner consistent with bona fide legal residence in North Carolina" and (2) "begins enrollment at an institution of higher education not later than the fall academic term next following completion of education prerequisite to admission at such institution."

(b) If a minor has lived for five or more consecutive years with relatives (other than parents) who are domiciled in North Carolina and if the relatives have functioned during this time as if they were personal guardians, the minor will be deemed a resident for tuition purposes for an enrolled term commencing immediately after at least five years in which these circumstances have existed. If under this consideration a minor is deemed to be a resident for tuition purposes immediately prior to his or her eighteenth birthday, that person on achieving majority will be deemed a legal resident of North Carolina of at least 12 months duration. This provision acts to confer in-state tuition status even in the face of other provisions of law to the contrary; however, a person deemed a resident of 12 months duration pursuant to this provision continues to be a legal resident of the State only so long as he or she does not abandon North Carolina domicile.

Lost but Regained Domicile. If a student ceases enrollment at or graduates from an institution of higher education while classified a resident for tuition purposes and then both abandons and reacquires North Carolina domicile within a 12-month period, that person, if he or she continues to maintain the reacquired domicile into

re-enrollment at an institution of higher education, may re-enroll at the in-state tuition rate without having to meet the usual 12-month durational requirement. However, any one person may receive the benefit of the provision only once.

Change of Status. A student admitted to initial enrollment in an institution (or permitted to re-enroll following an absence from the institutional program which involved a formal withdrawal from enrollment) must be classified by the admitting institution either as a resident or as a nonresident for tuition purposes prior to actual enrollment. A residence status classification once assigned (and finalized pursuant to any appeal properly taken) may be changed thereafter (with corresponding change in billing rates) only at intervals corresponding with the established primary divisions of the academic year.

Transfer Students. When a student transfers from one North Carolina public institution of higher education to another, he or she is treated as a new student by the institution to which he or she is transferring and must be assigned an initial residence status classification for tuition purposes.

Appeal Procedure. A student may request a review of decisions by the Undergraduate Admissions Office or Office of the Registrar relating to in-state or out-of-state residence for tuition purposes through the Internal Audit Office. Appeals should be submitted in writing, and must include address, telephone number and student I.D. number. Graduate student appeals should be submitted to the Graduate School.

TUITION AND FEES PER SEMESTER

Following are tuition and fees authorized for 1996-97. They are subject to change by the appropriate authorities.

UNDERGRADUATES		
	Resident	Non-Resident
0 Hrs.	$215.50	$1110.50
1-5 Hrs.	215.50	1110.50
6-8 Hrs.	435.50	2223.50
9-11 Hrs.	750.00	3433.00
12 or more Hrs.	859.00	4436.00

GRADUATES		
	Resident	Non-Resident
0 Hrs. (Thesis Only)	$206.00	$628.00
0 Hrs.	215.50	1110.50
1-2 Hrs.	215.50	1110.50
3-5 Hrs.	325.50	2223.50
6-8 Hrs.	544.50	3227.50
9 or more Hrs.	859.00	4436.00

Post-baccalaureate students who are taking only undergraduate courses will pay tuition and fees at the undergraduate rate Post-baccalaureate students taking one or more graduate credit courses will pay tuition and fees at the graduate rate for all courses.

The following Student Activities Fees are included in the full-time tuition and fee amounts. Fees per semester are:

Educational and Technology	$38.00
Student Activity Facility	65.00
Student Activity Center Operations	50.00
Cone Center Facilities	10.00
Cone Center Operating	56.50
Student Activity	18.00
Physical Education Facilities Maintenance	3.00
Health Center	46.00
Athletic	123.00
Intramural	10.50
Student I.D.	1.00
Telephone Registration	1.00
Total fees per full-time student, per semester	$422.00

HOUSING PER SEMESTER

Shared Residence Hall space is **not** available to married students. The following **1997-98** prices and plans are subject to change.

Apartment	$1,068.00 to $1,230.00
Residence Hall -- Double Room	$898.00
Residence Hall -- Single Room (if available)	$1,282.00
Suite	$1,068.00 to $1,204.00

DINING SERVICES PER SEMESTER

Following are options available to freshmen living in housing areas that require meal plans:

15 meals per week with $225.00 declining balance	$985.00
15 meals per week with $100 declining balance	$885.00
15 meals per week	$825.00
12 meals per week with $150.00 declining balance	$885.00
12 meals per week	$799.00

Upper-classmen living in housing areas that require purchase of a meal plan may select one of the plans listed above, or one of the following:

Declining Balance Account	$600.00 or $885.00
7 meals per week with $175.00 declining balance	$730.00
7 meals per week	$575.00
85 meals with $75.00 declining balance	$540.00

Commuters or UNC Charlotte apartment residents may purchase any of the plans listed above or a Declining Balance account in the amount of $400.00.

Any student, faculty, or staff member may purchase, or add additional, Optional Declining Balance funds to their 49er ID card. Optional Declining Balance can be purchased directly from the food service contractor, Marriott Management Services, located in the ID Card office in the Cone Student Center. New Optional Declining Balance accounts require a minimum purchase of $25.00 and may be paid in cash, by check, or charged to Visa or Mastercard.

SPECIAL ASSESSMENTS

During 1996-97, the following special assessments were charged to cover the cost of supplies or special materials (per semester, except where indicated otherwise):

National League for Nursing Achievement Test (per test)	$27.00
Scuba Diving (HPED 2219)	$60.00
Advanced Scuba Diving (HPED 2220)	$35.00
Applied Music Fee (1 credit hour)	$45.00
Applied Music Fee (2 credit hours)	$90.00
College of Engineering student fee	
1-7 hours (per academic year)	$76.00
8 hours or more (per academic year)	$150.00
Teacher Licensure Fee	$30.00
Cooperative Education Fee	$65.00
Architecture Major General Student Fee (per academic year)	$70.00
International Student Fee (per academic year)	$100.00
Administrative Cancellation Fee	$75.00

Application Fee. A $35 application fee must be submitted with the application for admission. The fee is not deductible and is not refundable.

New Student Fee. All new degree-seeking undergraduate students (freshmen and transfers) will be required to pay a one-time $25 new student fee.

Housing Deposit. Admission to UNC Charlotte does not guarantee residence hall space. Arrangements for on-campus housing are made, after admission, with the Associate Vice Chancellor for Housing and Residence Life. On-campus housing is not available for married students.

All housing applications must be submitted with a $100 deposit. The deposit is refundable, minus any outstanding damages and charges, upon departure from the residence life system. No deposits for fall semester are refunded after May 15. No refunds for spring semester are made after November 30. All students living in the residence halls will have an $11 Residence Hall Association fee included in their semester housing charges.

Student Activities Fee. A part of the general fee provides students with a program of cultural, recreational and entertainment activities. It pays for admission to many athletic contests, dramatic productions, activities sponsored by the University Program Board, social and entertainment functions, and for subscriptions to the campus newspaper and literary magazine.

Graduation Fee. Each member of the graduating class must pay a graduation fee of $25 at the time he/she applies for the degree. This fee includes the cost of the diploma and the cap and gown. No reduction of the fee is allowed for those receiving degrees in *absentia*. For graduate students, the cost of renting a hood is in addition to the $25 charge.

Credit By Examination Fee. Fees for credit by examination are as follows: A written examination for a course will require a fee of $15. A laboratory examination requiring the arrangement of such things as laboratory materials will require a fee of $25. A combination of a laboratory and written examination will require a fee of $30.

Tuition Surcharge. Undergraduate students who take more than 140 credit hours (or more than 110% of the hours required to complete their baccalaureate degree program) are subject to a 25% tuition surcharge on the excess hours taken. However, the surcharge will not apply to students who exceed these credit hour limits while completing their degree within the equivalent of four academic years, or in the case of five-year programs, within the equivalent of five academic years. Finally, the surcharge does not apply to students who entered the University before Fall 1994.

MOTOR VEHICLE REGISTRATION FEES

Students attending UNC Charlotte are required to register their motor vehicles(s) in order to park on campus; there is no free parking. Vehicle registration for fall and spring semesters begins two weeks prior to the first day of classes. Students may request parking permits to be mailed directly to them by contacting Parking Services at least one month prior to the beginning of classes (704-547-4285). Payment must be made before permit is mailed. Enforcement begins the first Monday after classes begin in the fall and spring semester, and the first day of class in the summer terms. Two categories of permits are issued: *Resident* (for students living on campus) and *Commuter* (for students living off campus).

Permits sold in August are good for one year. Students who graduate in December may return their parking permit for a partial refund. The price of the permit is the same for faculty, staff and students. In 1997-98, permits cost $155 but this cost is subject to change. Parking Services receives no state funding, therefore, parking fees are used to defray construction and operating expenses.

Night permits, valid only after 3 p.m., are sold at a reduced rate using the same schedule as the regular student permits. Students with night permits who come on campus before that time must park and pay at the meters or in the visitors deck.

Penalties for Parking Violations. Violators of University parking regulations are subject to monetary penalties ranging from $5 to $100, depending on the seriousness of the violation. Copies of parking regulations are distributed with the parking permit. If citations are not paid or appealed within five days, the penalty will be applied to the student's account with the University. Subsequent registration may be withheld for non-payment. Parking citations are issued from 8:00 a.m. until midnight, Monday through Thursday and from 8:00 a.m. until 3:00 p.m. on Friday.

Questions concerning parking on campus should be directed to Parking Services, which is open from 8:00 a.m. until 5:00 p.m. Monday through Friday. Emergency situations and questions at other times should be directed to 547-2200.

REFUNDS

Tuition and Fees Refunds

A student who officially withdraws from the University in the fall or spring semester will receive a refund as follows:

Fall or Spring Semester	% of Tuition and Fees Refunded
Before 1st Class Day	100%
Week #1	100% minus $25.00 withdrawal fee
Week #2	100% minus $75.00 withdrawal fee
Week #3	80%
Week #4	75%
Week #5	70%
Week #6	60%
Week #7	55%
Week #8	50%
Week #9	40%
After Week #9	0%

Summer School: A student who officially withdraws from the University during summer school will receive a refund as follows:

5 and 10 Week Summer Terms	% of Tuition and Fees Refunded
Before 1st Class Day	100%
Day 1	100% minus $10 registration fee
Day 2 - 3	90%
Day 4 - 5	80%
Day 6 - 7	70%
Day 8 - 10	60%
Day 11 - 12	50%
Day 13 - 15	40%
After Day 15	0%

Students registered for short courses and institutes **only** during summer school will receive refunds upon withdrawal from the University as follows:

Special Term	% of Tuition and Fees Refunded
Before 1st Class Day	100%
First Class Day	100% minus $10 registration fee
Second Class Day	50%
After Second Class Day	0%

Exception: Charges are refundable by administrative action on a prorated basis for the unexpired portion of the term for the following reasons: death of the student, withdrawal for adequate medical reason as certified by the University student health center or family doctor, death in the immediate family which necessitates student withdrawal, and dismissal or suspension from school. Appropriate documentation must be submitted to the Registrar.

Housing Refunds

The rental period for academic-year contracts is for the entire academic year (fall and spring semesters) continuing until the end of the spring semester, regardless of occupancy date after the fall semester begins. The housing and dining contract binds the student and/or guarantor to the full amount of charges for housing for the academic year except as noted:

Effect of Cancellation

Cancellation Date	*Effect of Cancellation*
• By 5:00 p.m. May 15, 1997, for **fall** 1997 semester: • By 5:00 p.m. on November 26, 1997, for **spring** 1998 semester:	$100 deposit refunded and all housing and dining charges removed from student's account.
• After 5:00 p.m. on May 15, 1997, to 5:00 p.m. on August 12, 1997, for **fall** 1997 semester: • After 5:00 p.m. on November 26, 1997, to 5:00 p.m. on January 5, 1998, for **spring** 1998 semester:	Forfeiture of $100 housing deposit; all other housing and dining charges removed from student's account.
• After 5:00 p.m. on August 12, 1997, for **fall** 1997 semester: • After 5:00 p.m. on January 5, 1998, for **spring** 1998 semester:	Forfeiture of $100 housing deposit; payment of $400 liquidation fee; housing charges on a prorata basis.

NOTE: Dates listed are for academic year 1997-98 only. Cancellation dates for future academic terms will be adjusted yearly to reflect the calendar. Total cost for period occupancy to student, including deposit and liquidation fee, will be limited to the total cost of semester housing.

Summer School: Summer school housing charges are refundable based on the number of weeks of occupancy.

Appeal Procedure

Appeals about tuition, and dining refunds should be submitted in writing to Student Accounts, UNC Charlotte,

Charlotte, NC 28223. Appeals about housing refunds should be submitted to Department of Housing, UNC Charlotte, Charlotte, NC 28223. Appeals are heard on a monthly schedule by the Tuition, Housing and Dining Appeal Committee.

FINANCIAL AID

UNC Charlotte administers financial aid without regard to race, color, national origin, religion, sex, sexual orientation, age or disability.

The University offers a comprehensive program of student financial aid (scholarships, grants, loans and part-time employment) to assist both graduate and undergraduate students in meeting educational expenses. Reasonable educational expenses include tuition and fees, room and board, books, supplies, transportation, miscellaneous personal expenses and expenses related to maintenance of a student's dependents.

Eligibility. The programs of student financial aid are administered according to a nationally accepted policy that the family, meaning parents (or those acting in place of parents) and/or spouse, is responsible for a student's educational expenses. Therefore, eligibility for financial aid will be determined by a comparison of a budget (educational expenses as defined above) for the period of attendance with what the student's family can reasonably be expected to contribute.

A financial aid applicant will be considered for available assistance for which he/she is eligible if the student:

1. Completes the application process and related forms only after thoroughly reading all instructions.
2. Completes the admission application process and is accepted for enrollment at UNC Charlotte.
3. Is working toward a degree and not simply taking courses.

Application Process

To apply for the following programs, a student must complete the **Free Federal Application for Financial Aid** using the instructions and mailing address provided with the form. The form is available in the UNC Charlotte Financial Aid Office and in high school counseling offices.

Federal Direct Student Loans
Federal Pell Grant*
Federal Perkins Loan
Federal Supplemental Educational Opportunity Grant*
Federal Work Study
N.C. Student Incentive Grant*
University Grants
University Loans
University Need-based Scholarships

* *For undergraduate students only.*

Renewal Process

Renewal of financial aid is based upon a student's making satisfactory academic progress. The Free Federal Application for Financial Aid is required each year that a student applies for financial aid.

Financial Aid Programs

Loans

Federal Perkins Loan--Applicants may request amounts based on financial need up to a total of $15,000 for a four-year degree and an aggregate total of $30,000 for graduate study. The interest rate is 5 percent, with repayment beginning nine months after graduation. To apply, an individual must complete the Financial Aid Form.

William D. Ford Federal Direct Loans--Qualified undergraduate applicants may borrow up to $2,625 for the first year, $3,500 for the second year, and up to $5,500 per year for the remainder of undergraduate study. Graduate students may borrow up to $8,500 per year. Independent students may be eligible to receive additional loan amounts. The interest rate is variable, and repayment begins six months after the borrower ceases to be a student.

Short-Term Emergency Loans--Students may borrow up to $150 for unanticipated expenses which occur during the semester and up to $600 for tuition expenses. The loans have a $1 service charge, but no interest is charged. Loans must be repaid within 30 to 60 days. Funds for these loans are provided by private donation.

Grants

Federal Pell Grants--These are for undergraduate students and can range from $400 to $2,700, based on the student's financial need. It is an entitlement program, meaning that any student who applies and is determined to be eligible will receive funds.

Federal Supplemental Educational Opportunity Grant--These are for undergraduate students and range from $200 to about $1,000. Eligibility is based on financial need and is determined within the UNC Charlotte Financial Aid Office.

North Carolina Minority Presence Grant Program--The University of North Carolina Board of Governors provides funding to historically white and historically black institutions to aid them in recruiting financially needy North Carolina students who would be minority presence students at the respective institutions by enabling the institutions to offer relatively more aid for minority presence students in the form of grants rather than loans. General Program Part I includes funds for minority presence grants for students attending the North Carolina Central University School of Law. General Program Part II consists of grant funds for Native Americans, Hispanics, and Asians.

UNC Charlotte Grants--UNC Charlotte administers several other grant programs funded by the State of North Carolina and requires North Carolina residency for consideration. These are available to both graduate and undergraduate students who apply by the established priority date of April 1.

Employment On-Campus. The Student Employment Office assists students in locating work on campus. The University participates in the federal Work-Study Program and attempts to match students with jobs related to their academic interests.

Part-time Employment Off-Campus. The University Career Center assists students in obtaining part-time employment off-campus. Job listings and assistance are available in the King Building. Students are encouraged also to participate in career related experiences such as co-op, internships, and 49erships which can be arranged through the University Career Center.

Education for the Vocationally Handicapped. Students who have suffered a disability which renders them vocationally handicapped are eligible for aid provided by the North Carolina State Division of Vocational Rehabilitation. This aid takes the form of services which include vocational counseling and guidance and placement. Payment of expenses such as training, medical treatment, room and board, books, fees and tuition may be available. A vocational rehabilitation officer is available in Charlotte for interviewing applicants. Appointments may be made by contacting Vocational Rehabilitation Services located at 1928 E. Independence Blvd., (704) 342-6218.

Veterans Benefits. The Office of the Registrar works with the Veterans Administration to assist in administering the various programs of benefit to veterans or eligible relatives of veterans. The veterans clerk in the Registrar's Office certifies enrollment and transmits necessary credentials and information to the proper Veterans Administrative Office.

Admission to the University should be obtained before the student makes application for veteran's benefits. Applicants must be accepted into a degree program to receive benefits.

In order to be eligible for the full monthly allowance under any of the above laws, an undergraduate student must be enrolled for 12 or more semester hours and a graduate student must be enrolled for nine or more semester hours. Those enrolled on a part-time basis will be eligible for part-time compensation. Students are responsible for reporting any change in enrollment status to the veterans clerk in the Registrar's Office.

Children of Veterans. The North Carolina Department of Veterans Affairs awards scholarships for the children of certain deceased or disabled veterans. Those awarded "full" scholarships are entitled to tuition, mandatory fees, board allowance and room allowance; those awarded "limited" scholarships are entitled to tuition and mandatory fees. All inquiries should be referred to the North Carolina Division of Veterans Affairs, 227 East Edenton St., Raleigh, NC 27601, telephone (919) 733-3851.

Before the time of registration, each eligible student who wishes to enter the University should: (1) apply for admission following University procedures, and (2) apply for a scholarship award to the North Carolina Department of Veterans Affairs.

SCHOLARSHIPS

UNC Charlotte offers a comprehensive program of undergraduate scholarships. Some of these are awarded entirely on the basis of merit, but individual financial need is a consideration in the awarding of many of them. The University's major awards for merit are the:

Alumni Scholarships
Cameron Scholarships
Colvard Scholarships
Bonnie E. Cone Scholarships
Fretwell Scholarships
Cameron Morrison
Stone Scholarships

The Alumni Scholarships for Merit are awarded annually to continuing students of the University who have proven outstanding scholastic attainment, participated in University and/or community activities, and demonstrated campus leadership. The scholarships were established in 1978 to recognize outstanding full-time students and to encourage their continuing involvement and interest in the activities of the University. Information concerning the scholarships is distributed to each department and college within the University each year prior to the award and contains material outlining application procedures for the scholarships.

The C.C. Cameron Scholarships established by First Union Corp., honor Mr. C.C. Cameron, who served as chairman of First Union and as chairman of the UNCC Board of Trustees. The purpose of the Cameron Scholars program is to bring outstanding students to UNC Charlotte. Recipients are selected on the basis of academic achievement, demonstrated leadership and service to others. Cameron Scholars are provided financial assistance and work experiences which encourage intellectual growth and stimulate the will to achieve full potential.

The Colvard Scholarships for Merit honor Dr. Dean Wallace Colvard, first chancellor of The University of North Carolina at Charlotte, and his wife, Martha, who were instrumental in founding Friends of UNCC. Dr. and Mrs. Colvard have personified the quest for excellence at UNC Charlotte. The Colvard Scholarships are awarded to applicants judged on the basis of their achievements in high school, college aptitude tests and their promise of making meaningful contributions to society. Their roles as leaders and their service to school and community are weighed carefully.

The Bonnie E. Cone Scholarships for Merit have been endowed by Clara McKay (Mrs. Charles H.) Stone of Charlotte and other friends of Charlotte College. The scholarships honor Dr. Bonnie E. Cone, founder and developer of Charlotte College, from which UNC Charlotte developed. The Bonnie E. Cone Scholarships are awarded annually to students having high moral character and proven scholastic attainment and whose further education at the University will, in the judgment of the scholarship committee, enhance the citizenship of the recipients and advance the service of UNC Charlotte as an institution of excellence.

The Fretwell Scholarships were established in 1990 in recognition of Dr. E.K. Fretwell Jr., chancellor of UNC Charlotte from 1979 to 1989. The primary purpose of the awards is to attract students of great potential to the University. The scholarships' founders believe that such students stimulate and challenge fellow students and faculty members. Fretwell Scholarships are awarded to graduating high school seniors based on achievements in school, college aptitude test scores, service to school and

community, and potential for leadership and for making meaningful contributions to society.

The Cameron Morrison Scholarships, first awarded in 1985, were established as a memorial to former Governor and Mrs. Cameron Morrison. The need-based scholarships recognize those students who are public high school graduates from Mecklenburg and Richmond Counties who seek self-improvement and demonstrate initiative and ability. To receive consideration, students must complete the general University application for financial assistance. Continuing students with a 3.0 or higher cumulative grade point average and entering students ranking in the upper 10 percent of their high school graduating class are given preference.

The Clara McKay Stone and Charles H. Stone Scholarships were established in 1986 and first awarded in 1987. Mr. and Mrs. Stone were early supporters and major benefactors of the University. Through their efforts the following were established: the Bonnie Cone Scholarships, the Charles H. Stone Professor of Chemistry, the Charles H. Stone Professors of American History, and the Charles H. Stone Collection of the University Library.

The purpose of the Stone Scholarships is to provide scholarship assistance for worthwhile and deserving students and applicants for admission to the University who have high moral character and whose education at the University will better enable the recipients to live worthwhile and productive lives and to further the service of the University to society. The fund provides both merit awards and awards for students who are deserving, but may not have the ability for high academic attainment, and who are in need of financial assistance in order to further their education at the University.

Detailed information about the scholarships named above, including minimum qualifications, selection processes and the amount of the stipends may be obtained from the Undergraduate Admissions Office.

Need-based and Departmental Scholarships. Numerous other scholarships are administered by the Student Financial Aid Office. In most cases, there is no special application for these scholarships, and all aid applicants will be considered unless the scholarship is noted as an exception. Normally, those students with demonstrated need and a grade point average of 3.5 or better will be considered for scholarships.

ACADEMIC REGULATIONS AND DEGREE REQUIREMENTS

Student Responsibility

Each student is responsible for the proper completion of his or her academic program, for familiarity with the *University Catalog*, for maintaining the grade average required and for meeting all other degree requirements. The adviser will counsel, but the final responsibility remains that of the student.

A student is required to have knowledge of and observe all regulations pertaining to campus life and student deportment. The University has enacted two codes of student responsibility: **The UNC Charlotte Code of Student Academic Integrity** and **The UNC Charlotte Code of Student Responsibility** which are summarized in this *Catalog*. As students willingly accept the benefits of membership in the UNC Charlotte academic community, they acquire obligations to observe and uphold the principles and standards that define the terms of UNC Charlotte community cooperation and make those benefits possible.

Each student is responsible for maintaining communication with the University and keeping on file with the Registrar's Office at all times a current address, including zip code and telephone number.

Each student, while associated with the University, is expected to participate in campus and community life in a manner that will reflect credit upon the student and the University.

CATALOG POLICIES

The *Catalog* is not an irrevocable contract. Regulations published in it are subject to change by the University at any time without notice. University regulations are policy statements to guide students, faculty and administrative officers in achieving the goals of the institution. Necessary interpretations of these policies will be made by the appropriate authorities with the interest of the students and the institution in mind. Students are encouraged to consult an adviser if they have questions about the application of any policy.

Each new edition of the catalog becomes effective at the opening of the fall semester following its publication. To receive a degree, an undergraduate student must complete satisfactorily all requirements described in the catalog in effect at the time of first enrollment as a degree student at the University or all requirements described in the catalog in effect at the time of graduation. Any student who changes from one major or minor to another must meet requirements of the new major or minor in effect at the time of the change. Any student who leaves the University or changes to another major or minor for a period of one calendar year or longer and then returns to the University or to the original major or minor will be required to meet requirements in effect at the time of return.

Exceptions to these policies may be necessitated by changes in course offerings, degree programs or by action of authorities higher than the University. In that event, every effort will be made to avoid penalizing the student.

ACADEMIC ADVISING

Each student entering a degree program at UNC Charlotte is assigned an academic adviser or advisory committee in the student's major field. The Advising Center in the College of Arts and Sciences advises students who have not yet chosen a major field and may be consulted by other students for information about general education requirements. The adviser assists the student to develop a plan of study based on the student's prior preparation and objectives. This assistance is not a substitute for the personal responsibility of the student described in the section of this *Catalog* on *Student Responsibility*.

COURSE LOAD

Credits/Semester Hours. The unit of measurement of University work is the *semester hour*. It ordinarily represents one lecture hour per week for one semester; however, a sequence of two or three laboratory hours is considered to be the equivalent of one lecture hour. Semester hours are also referred to as credit hours or credits. A bachelor's degree requires 120-128 semester hours.

Course Load. A course load of 15-18 hours constitutes a normal full semester program for undergraduates. A student must complete 15-16 hours per semester to complete a bachelor's degree in four academic years. Enrollment in more than 18 hours in a semester requires advance written approval of the Dean of the student's major college. An undergraduate student enrolled in 12 or more hours is considered to be a full-time student and must pay full tuition and fees.

A standard load for an undergraduate student enrolled in a summer session is 6-7 credit hours. Enrollment in more than 7 credit hours in a single summer session, or in concurrent summer sessions (e.g., a 10 week and a 5 week session) requires advance written approval of the Dean of the student's major college.

The appropriate course load for an undergraduate student is dependent on two factors: scholastic ability as reflected by the student's academic history and available study time. Successful academic achievement usually requires about two hours of study per week outside of class for each credit hour in which the student is enrolled. For example, enrollment in 16 hours would require about 32 hours of outside preparation per week.

Tuition Surcharge. Undergraduate students who take more than 140 credit hours (or more than 110% of the hours required to complete their baccalaureate degree program) are subject to a 25% tuition surcharge on the excess hours taken. However, the surcharge will not apply to students who exceed these credit hour limits while completing their degree within the equivalent of four academic years, or in the case of five-year programs, within the equivalent of five academic years. (One quarter of enrollment at an institution on the quarter system equals two-thirds of a semester.) Finally, the surcharge does not apply to students entering the University before Fall 1994.

Credit hours that count toward the specified limits include: all courses attempted at UNC Charlotte during the fall and spring semesters (including repeated courses, failed courses, and those dropped after the last date to drop or withdraw without record); and all transfer credit hours (except those earned during summer sessions at another UNC institution). The maximum transfer credit hours applied toward the surcharge limit are the total hours required for the degree less the 30 hours necessary to meet residence requirements.

PROGRESSION REQUIREMENT

Undergraduate students entering UNC Charlotte in Fall 1993 or after are required to progress toward completion of a bachelor's degree program without exceeding the allowed differences in progression *hours* and *hours earned* indicated as follows:

Progression Hours	Difference in Hours Earned
30-44	12
45-59	15
60-74	18
75-89	21
90-104	24
105-119	27
120-180	30

A student who exceeds the allowed difference in progression hours and hours earned will be placed on probation. A student who has failed to achieve good standing by the end of two successive semesters on probation (excluding summer sessions) will be suspended. The maximum number of hours that a student may attempt to earn a bachelor's degree is 180 hours, or 30 hours beyond the hours required for the degree, whichever is

larger. See **Course Exclusion Policy** under Grading Policies.

Hours earned are defined as all hours for which a student is awarded credit.

Progression Hours are defined as all hours for which a student registers for credit plus hours equivalent to transfer hours earned and hours earned through credit by examination. They include:

a. all courses for which a grade is earned;
b. all repeated courses;
c. all courses for which a grade of *W* is assigned; and
d. courses taken under the *Pass/No Credit* Option if there are hours earned.

Progression hours do not include hours for which no grade or a grade of *I* (incomplete) is assigned or for an unsuccessful attempt to receive credit by examination. A transfer student receives the same number of progression hours as the hours accepted for transfer. A student readmitted under either the A.A. Degree Rule or the Two-Year Rule (see *Readmission of Former Students* in this *Catalog*) receives the same number of progression hours as the hours accepted upon readmission.

Student Classification. At the beginning of each semester, regular students working toward a bachelor's degree are classified on the basis of earned semester hours:

Classification	Earned Semester Hours
Freshman	0-29
Sophomore	30-59
Junior	60-89
Senior	90 or more

REGISTRATION

The Registrar is responsible for the management of the registration process by which students enroll in classes. Registration policies and procedures for each term are described in the **Schedule of Classes** for that term.

Through the registration process, students assume academic and financial responsibility for the classes in which they enroll. They are relieved of these responsibilities only by formally terminating enrollment by dropping or withdrawing in accordance with procedures and deadlines specified in the **Schedule of Classes** each term.

Registration Deadlines. University policies determine when students may enroll or adjust their enrollment in classes. Deadlines for the spring and fall semesters are shown below: (*Deadlines for summer sessions are approximately proportional based on the length of the session.)*

Register for classes through the eighth instructional day of the semester.

Drop a class without record (and remain enrolled in other classes) through the sixth instructional day of the semester.

Withdraw from the University without record through the sixth instructional day of the semester.

Drop a class with grade of W recorded (and remain enrolled in other classes) through the sixth week of classes in the semester. No student will be allowed to drop a course after this deadline unless there are extenuating circumstances recognized by the University.

Withdraw from the University with grade of W recorded after the sixth instructional day through the third week prior to the last day of classes of the semester. No student will be allowed to withdraw after this deadline unless there are extenuating circumstances recognized by the University. (See *Termination of Enrollment* section of this *Catalog*.)

Prerequisites and Permits. Credit will be awarded only to students who are properly registered for it. All students, including visitors and non-degree students, are required to meet course prerequisites and to obtain the required permissions to enroll in courses specified in the **Schedule of Classes.**

Auditors. With the consent of the instructor, a student may register as an *auditor* for any class in which space is available. Fees and procedures for this non-credit enrollment are the same as those for a credit enrollment.

No student will be allowed to change the designation of a course from audit to credit or from credit to audit after the eighth instructional day of a semester (or a proportional period for summer school).

The participation of auditors in class discussion and in tests or examinations is optional with the instructor. Auditors receive no University credit, but they are expected to attend class regularly. A formal record of the audit on the student's transcript is entered at the discretion of the instructor at the end of the course. The procedure for adding or dropping an audit course is the same as for credit enrollments.

Dual Undergraduate and Graduate Registration. Undergraduate students at UNC Charlotte who are required to take fewer than 12 semester hours of undergraduate work to fulfill all requirements for the bachelor's degree may be allowed during their final semester to enroll in certain courses for the purpose of obtaining graduate credit. Authorization for dual undergraduate/graduate registration may be obtained by submitting to the Dean of the Graduate School a Special Request Form approved by the student's undergraduate academic adviser, the instructor(s) of the graduate course(s), and the dean(s) of the college(s) offering the graduate course(s), accompanied by the regular application for admission to graduate study and supporting credentials. The total hours to be carried in this status shall not exceed 12 hours, of which no more than nine may be for graduate credit. On the basis of work attempted prior to the final semester, such student must meet the grade point criteria for admission to a graduate degree program at the University. No course for which credit is applied to an undergraduate degree may receive graduate credit. Permission to take graduate courses under dual registration does not constitute admission to any graduate degree program at the University.

Consortium Registration. The Charlotte Area Educational Consortium offers an inter-institutional

exchange during the fall and spring semesters for *full-time undergraduate* students, UNC Charlotte students may take courses *not available at UNC Charlotte* at one of the institutions listed below and have them appear on their transcript and be computed in their grade point average at this University. The registration process is initiated in the Registration Office and requires the approval of the student's college dean.

Anson Community College
Barber-Scotia College
Belmont Abbey College
Catawba College
Catawba Valley Community College
Central Piedmont Community College
Cleveland Community College
Davidson College
Gardner-Webb University
Gaston College
Johnson C. Smith University
Lenoir-Rhyne College
Livingstone College
Mitchell Community College
Pfeiffer College
Queens College
Rowan-Cabarrus Community College
Stanly Community College
University of South Carolina at Lancaster
Wingate College
Winthrop University
York Technical College

Inter-Institutional Registration. An inter-institutional registration program is available for a limited number of undergraduate and graduate students with the University of North Carolina at Greensboro, North Carolina State University, University of North Carolina at Chapel Hill and Duke University. The registration process is initiated in the Registrar's Office and requires the approval of the student's college dean.

TERMINATION OF ENROLLMENT

Drop. A student may terminate enrollment in a course but continue enrollment in other courses by following the procedure to drop a course specified in the **Schedule of Classes.** A student enrolled in only one course must withdraw officially from the University to drop the course.

Withdrawal. Any student voluntarily leaving the University before the close of the term must withdraw officially. A student initiates the withdrawal procedure and files the completed form at the Registrar's Office in person or by letter. A withdrawal is effective when the form or letter is received by the Registrar's Office. A student who withdraws from the University after the sixth instructional day will receive the grade of *W* for all courses in progress. No student will be allowed to withdraw within two weeks prior to the last day of class (or as close to half the summer term as possible) unless there are extenuating circumstances such as serious illness recognized by the University and approved by the student's dean.

Any student who leaves the University before the close of a term without withdrawing officially will receive a failing or unsatisfactory grade (*F* for undergraduate credit and *U* for graduate credit) in each course for which he/she is registered. A graduate student who receives a *U* must appeal to the Dean of the Graduate School for reinstatement.

ATTENDANCE POLICY

Each instructor determines the attendance regulations for his or her classes. Students are expected to attend punctually all scheduled sessions in the courses for which they are registered and are responsible for completing the work from all class sessions.

Absences from class may be excused by the instructor for such reasons as personal illness, religious holidays, or participating as an authorized University representative in an out-of-town event. Whenever possible, students are expected to seek the permission of the instructor prior to absences.

DEGREE OR MAJOR PROGRAMS AND MINORS

Declaration of a Major. Undergraduate students must declare and be accepted into a major field of study, or a pre-professional program, by the time they have earned 60 semester hours of credit. Transfer students entering with 45 to 74 semester hours must declare and be accepted into a major field of study by the time they have earned 15 semester hours at UNC Charlotte. Transfer students entering with 75 or more semester hours must be accepted into a major as a condition for admission. Students who do not satisfy these requirements must have permission from the Dean of Arts and Sciences to register for classes.

To facilitate the declaration process, advising is required prior to registration for continuing students who have completed 45 hours or more and have not been accepted into a major or pre-professional program.

Change of Degree or Major Program. An undergraduate student may change from one degree program or area of academic concentration to another when space is available provided he/she meets the prerequisites for admission to the new program and has appropriate written approval via a "Declaration of Program" filed at the Registrar's Office.

Second Baccalaureate Major. Students who have earned a bachelor's degree from UNC Charlotte or are working on a bachelor's degree at UNC Charlotte may enroll in a program leading to a second major under the same degree provided (1) the second major field selected is different from the first; (2) the student meets the requirements for acceptance into the second major program; and (3) the appropriate application for admission or "Declaration of Program" is filed and approved.

Minor. Students who have earned a bachelor's degree from UNC Charlotte or are working on a bachelor's degree at UNC Charlotte may enroll in a program leading to a minor (or minors) under that degree provided: (1) the student meets the requirements for acceptance into the minor program; and (2) the appropriate application for admission or "Declaration of Program" is filed and approved.

Second Baccalaureate Degree. Students who have earned bachelor's degrees from UNC Charlotte or other

accredited institutions may enroll in a program leading to a second degree at the same level provided: (1) the major field selected is different from that of the first degree; (2) the degree sought is different than the first when that degree was granted by UNC Charlotte; and (3) the appropriate application for admission is filed and approved.

Students seeking a second baccalaureate degree must: (1) satisfy residency requirements if their first degree was not earned at UNC Charlotte; (2) achieve a minimum grade point average of 2.0 on all work attempted toward the second degree; and (3) satisfy all department and college requirements for the degree sought. Students who hold a baccalaureate degree from an accredited institution will not be required to satisfy the UNC Charlotte General Education requirements for a second degree.

Students who complete the equivalent of a double major in areas for which different degrees are awarded, but who have not met the requirements for the second degree, may have their accomplishment acknowledged by an appropriate notation on their transcript.

GRADING POLICIES

Instructors assign grades on the basis of their evaluation of the academic performance of each student enrolled in their courses. At the end of the term, the grades are reported to the Registrar's Office which is responsible for maintaining student academic records and reporting grades to students.

Grade Reports. All students enrolled in the University receive reports of *final grades* from the Registrar after the close of each term. The reports are mailed to the student at the address designated by the student. Final grades also are available through the telephone registration system (consult **Schedule of Classes** for access instructions). In addition, the faculty will send special reports of *unsatisfactory grades* to the students near the middle of each regular semester.

Final Grade Changes. When a grade of other than *Incomplete* (I) is reported officially by an instructor at the end of a term, the grade is recorded by the Registrar and can be changed only if an error has been made in assigning or reporting the grade. When a grade is assigned consistent with University policy, only the instructor has the right to change the grade except as provided in the *Incomplete* grade policy. When an instructor reports a change for a grade other than *I*, the Change of Grade Form must be signed by his/her department chairperson and dean.

Students who think an error in grading has been made are advised to consult with the instructor as soon as the formal grade report is received. The erroneous grade must be reported to the instructor for correction during the next semester (fall or spring) in residence but no later than 12 months after the term in which the grade was assigned, whichever comes first.

Grades. Letters are used to designate the quality of student academic achievement.

UNDERGRADUATE GRADES

Letter	Meaning	Grade Points Per Semester Hour
A	Excellent	4
B	Good	3
C	Fair	2
D	Passing	1
F	Failing	0
I	Incomplete	*
IP	In Progress	*
W	Withdrawal	*
AU	Audit	*
NR	No recognition given for audit	*

Letter	Meaning	Grade Points Per Semester Hour
	Cooperative Education	
S	Satisfactory	*
U	Unsatisfactory	*
	Pass/No Credit	
H	Honors	*
P	Passing	*
N	No Credit	*

** Not used in computation of grade point average*

Grade of *I* (Incomplete). The grade of *I* is assigned *at the discretion of the instructor* when a student who is otherwise passing has not, due to circumstances beyond his/her control, completed all the work in the course. The missing work must be completed by the deadline specified by the instructor or during the next semester (fall or spring) in residence, but no later than 12 months after the term in which the *I* was assigned, whichever comes first. If the *I* is not removed during the specified time, a grade of *F, U* or *N* as appropriate is automatically assigned. *The grade of I cannot be removed by enrolling again in the same course.*

Grade of *W* (Withdrawal or Drop). No grade will be given for a course dropped on or before the last day to drop a course without record. After this period a student who is permitted to drop or withdraw from a course will receive a grade of *W*. Only students with such extenuating circumstances as serious illness will be permitted to drop a course after the sixth week of classes in the semester or to withdraw from all courses during the last two weeks of classes in the semester. Unsatisfactory academic performance itself is not an extenuating circumstance. The time of withdrawal is determined by when the drop card or withdrawal form is accepted by the Registrar's Office.

Pass/No Credit Option. Every student will be permitted during his/her *undergraduate* years to select a total of four courses in which he/she will be evaluated on a pass/no credit basis. Only one such course may be selected during an academic year. Every course in the University is offered on this basis *except* when taken by a student for departmental credit toward his/her major or minor or to satisfy University general education (COGE) requirements. Courses completed with the grade of Honors or Pass will count toward graduation, but they will not be considered in the computation of the grade point average.

This option is designed to encourage curiosity, exploration and experimentation in areas where a student has strong interest but little or no previous experience. **Note:** Courses designated by the faculty to be graded only on a *Pass/No Credit* basis are not counted as part of this option.

The student must declare his/her intention to take a *Pass/No Credit* option by the end of the eighth instructional day in the semester.

Grades for General Education Courses. A course taken to satisfy a general education requirement must be graded *A, B, C, D, F* unless it is offered only with *Pass/No Credit* grading. The *Pass/No Credit* Option described above cannot be applied to general education courses.

Repeated Courses. *Courses listed as "May be repeated for credit" are not subject to the following regulations for repeated courses.* A student who has received a grade of *C, H, P* or better in a course may repeat that course only with the prior approval of the student's adviser, department chair and dean. A student may receive credit for a course one time only unless the course description specifies that it "may be repeated for credit."

When an undergraduate student who entered UNC Charlotte before Fall 1993 repeats a course, no additional hours attempted accrue, and the last grade replaces the previous grade in computing the grade point average and in the assignment of academic credit. However, all entries remain a part of the student's permanent record.

Effective for students who enter UNC Charlotte beginning Fall 1993, all enrollments in courses graded *A, B, C, D,* and *F,* including repeated courses, are used in the computation of the overall grade point average and the progression hours.

Course Exclusion Policy. An undergraduate student entering UNC Charlotte in Fall Semester 1993 or after may exercise an option to exclude courses from computation of the grade point average (GPA), progression hours, and hours earned during work toward a bachelor's degree. Once a decision to exercise an exclusion has been made, that decision is irrevocable. All excluded courses are still shown on the student's permanent academic record and transcript.

The number of course exclusions for which a student is eligible is determined by the number of hours accepted toward a degree at the time the student is admitted:

Admission Status and Hours Accepted	Course Exclusions	Maximum Hours Excluded
0-29 hours	4	13
30-59 hours	3	10
60-89 hours	2	7
90 or more hours	1	4
Candidate for Second Bachelor's Degree	1	4

The number of exclusions for which a student readmitted under the A.A. Degree Rule or the Two-Year Rule is eligible is based on the number of hours accepted at the time of readmission. In no case, however, can the number of exclusions exceed four in a student's career at UNC Charlotte.

To implement a course exclusion, a student files a form in the Registrar's Office. At the end of the semester, the cumulative grade point average and the progression hours and hours earned are recalculated without the excluded course. **Students are strongly advised to consult with their academic adviser before excluding a course.**

Grade Point Average. The grade point average for an undergraduate student is determined by multiplying the number of grade points for each grade by the number of semester hours credit received in that course, adding all accumulated grade points together, and then dividing by the total number of semester hours the student has attempted, except those for which the student received a grade of *I, W, H, P, Au,* or *N*. In computing the grade point average, only those credits attempted at UNC Charlotte or through the Charlotte Area Educational Consortium are included. Repeated courses are treated differently in the grade point averages of students who entered UNC Charlotte prior to Fall 1993 and those who enter Fall 1993 and later. See *Repeated Courses* section above.

Grade Point Deficit. The grade point deficit is the number of additional grade points required to bring a student's cumulative grade point average up to 2.0.

ACADEMIC RECORDS AND TRANSCRIPTS

The Registrar is responsible for maintaining the official academic records for all students. Upon *written request by the student,* an official transcript of the academic record will be issued to the person or institution designated, provided that all the student's obligations to the University have been settled satisfactorily.

Each student is entitled to one transcript without cost, regardless of how early in his/her academic career the request is made. A fee of $3 per copy must accompany subsequent requests. Requests should reach the Registrar's Office at least one week before the date the transcript is needed.

PRIVACY OF STUDENT EDUCATIONAL RECORDS

Federal law (the "Buckley Amendment") creates for students the following rights with respect to their education records:

1. To inspect and review information contained in records.
2. To challenge the content of the records.
3. To a hearing if the outcome of the challenge is unsatisfactory to the student.
4. To submit an explanatory statement for inclusion in the record if the outcome of the hearing is unsatisfactory.
5. To prevent disclosure, with certain exceptions, of personally identifiable information.
6. To secure a copy of the UNC Charlotte policy on education records, which lists the locations of all education records maintained by the University.
7. To file complaints with the U.S. Department of Education concerning alleged failures by the institution to comply with the Buckley Amendment.

UNC Charlotte intends to comply fully with those requirements. Policy Statement No. 69, "The Privacy of Educational Records," explains the procedures for compliance. Students may obtain copies of the Policy in the Office of the Registrar, and copies of the policy statement are available for inspection in the offices of each dean and department chair. The policy includes a list of the locations of all education records maintained by the institution.

The following categories of personally identifiable information about students have been designated as public or "directory" information which may be disclosed for any purpose without student consent: name, local and permanent address, telephone number, email address, date and place of birth, class, major field of study, dates of attendance, degrees and awards (including scholarships) received, participation in officially recognized activities and sports, and weight and height of members of an athletic team.

Currently enrolled students may withhold disclosure of information in any category by completing the appropriate form available in the Office of the Registrar. Written requests for non-disclosure will be honored for a maximum of one year, and all such requests will expire on the following August 31. UNC Charlotte assumes that failure to complete the request indicates approval for disclosure.

All questions concerning this policy on educational records may be directed to the attention of the Registrar.

ACADEMIC HONORS

Chancellor's List. The Chancellor's List recognizes undergraduate students with outstanding records of academic performance. To qualify for the Chancellor's List during the fall or spring semester, a full-time student must earn a grade point average of at least 3.8 in 12 or more semester hours of credit graded *A, B,* or *C* with no grade less than *C*. A part-time student must earn a combined fall and spring grade point average of at least 3.8 in 12 or more semester hours of credit graded *A, B,* or *C* with no grade less than *C*. To qualify for the Chancellor's List as a part-time student, a student must enroll on a part-time basis in both fall and spring semesters in the same academic year. Students who receive the grade of *AU, H,* or *P* are not excluded from recognition as long as 12 hours are completed with *A, B,* or *C*. Students who receive the grade of *D, F, I, NR* or *N* are not eligible for recognition.

Dean's List. The Dean's List recognizes undergraduate students who earn a grade point average of at least 3.4 and not more than 3.79 and meet all other criteria as described for the Chancellor's List.

Commencement Marshals. At each commencement ceremony, the University honors the juniors with the highest grade point averages by inviting them to serve as the marshals who lead the processions of graduates, faculty members, and the platform party. To select students for this honor, the University considers juniors who have completed 75 hours of degree work, enrolled full-time (12 or more hours per semester) during the two most recent semesters, and are able to attend the ceremony.

Graduation With Distinction. Each of the undergraduate degrees is awarded *Summa Cum Laude* when the graduating student's cumulative grade point average is 4.0, *Magna Cum Laude* when it is at least 3.8 but less than 4.0, and *Cum Laude* when it is 3.4 or more but less than 3.8. To be eligible to graduate with distinction, a student must have a grade point average computed on at least 48 semester hours of credit completed in residence at UNC Charlotte.

REQUIREMENTS FOR CONTINUED ENROLLMENT

Good Academic Standing. An undergraduate student must maintain a cumulative grade point average of 2.0 or above at UNC Charlotte and not exceed the allowed difference between progression hours and hours earned to remain in good academic standing.

Academic Probation. An undergraduate student who has a grade point deficit between one and 13 and/or who exceeds the allowed difference in progression hours and hours earned is placed on academic probation, and this is noted on the student's academic record and grade report.

Academic Suspension. A student is suspended when either of the following apply: (1) the student has a grade point deficit of 14 or more, **OR** (2) the student fails to

achieve good standing by the end of two successive semesters on probation (excluding summer sessions).

However, a student will not be suspended:

(1) who was in good standing at the end of the most recent regular semester (excluding summer sessions); **OR**
(2) who is finishing the first regular semester of enrollment (excluding summer sessions) at UNC Charlotte; **OR**
(3) who has a 2.5 GPA for the current semester (excluding summer sessions) and does not exceed the allowed difference between progression hours and hours earned; **OR**
(4) who is readmitted after a break in UNC Charlotte enrollment of two calendar years or more.

Exception for Summer Enrollment. Students who are on academic suspension are permitted to enroll in summer session classes. They are not eligible to continue enrollment in the fall and spring semesters until they have applied and been approved for readmission.

REQUIREMENTS FOR READMISSION AFTER ACADEMIC SUSPENSION OR TERMINATION

An undergraduate student under suspension must satisfy the admission requirements as stated elsewhere in this *Catalog* to qualify for readmission.

In addition, an undergraduate student who has been suspended for failure to satisfy the requirements for continued enrollment stated above will be ineligible for readmission until (1) the expiration of the next semester following suspension (except that he/she will be permitted to enroll in the summer session); (2) he/she meets the requirements for continued enrollment; (3) he/she earns an associate of arts (AA) degree from an accredited two-year institution; or (4) the student elects to use the Two-Year-Rule. A suspended student who originally entered UNC Charlotte Fall 1993 or later is eligible for one readmission to the University (but not to a specific program) using either the A.A. Degree Rule or the Two-Year-Rule. (See *Readmission of Former Students* in this *Catalog*.) If readmitted, the student is expected to satisfy the requirements for continued enrollment.

Second Suspension. At the end of the semester in which the student fails to meet the requirements for continued enrollment for the second time, he/she will be suspended and may be readmitted only after meeting the requirements for continued enrollment. The student has recourse for meeting the requirements for readmission by attending summer sessions at UNC Charlotte.

Note: Readmission after suspension or after an incomplete semester, whether caused by withdrawal or suspension, is not automatic. An application for readmission must be made and approved. Included in the approval must be an acceptance from the department in which the student would major. (See the section on *Readmission of Former Students* elsewhere in this *Catalog*.)

APPEAL PROCEDURES

An undergraduate student may appeal decisions about suspension by submitting a written statement to the Admissions Advisory Committee in care of the Director of Admissions.

Other grievances relating to academic status are to be addressed by the college where the grievance arises, or if no particular college is appropriate, by the Associate Vice Chancellor for Academic Programs. Written procedures are available from the dean of each college and the Associate Vice Chancellor for Academic Programs.

TRANSFER CREDIT AND ADVANCED ACADEMIC STANDING

Evaluation of transfer credits, advanced standing, CLEP, APP, and IB are coordinated through the Office of Undergraduate Admissions. Prospective students who desire further information about policies and procedures for awarding credit should contact the Undergraduate Admissions Office.

UNC Charlotte will accept appropriate undergraduate credits earned through APP, IB, CLEP, correspondence courses, extension courses, armed forces service schools, and college-level courses completed prior to graduation from high school. In addition, UNC Charlotte will accept or transfer appropriate undergraduate and graduate credits earned at another accredited institution or through credit by examination. Credit toward a degree is not awarded for Continuing Education Units (CEUs).

Advanced Placement Course Credit (APP). The University will accept appropriate undergraduate credits earned through Advanced Placement Program Tests completed prior to graduation from high school. Students must request that official Advanced Placement test results be sent directly to the Office of Undergraduate Admissions for evaluation (UNC Charlotte code-5105). Prospective students who desire further information about policies and procedures for awarding credit should contact the Office of Undergraduate Admissions.

International Baccalaureate Program (IB). The University will award credit for subjects in which students score appropriate scores on the IB examinations. Contact the Office of Undergraduate Admissions for further information.

College Level Examination Program (CLEP) General Examination. An undergraduate student may receive up to 23 semester hours of elective credit.

Subject Matter Examinations. Credit may be awarded for subject matter examinations listed below at the levels recommended in the current edition of *CLEP Scores: Interpretation and Use*:

<u>Business</u>
Information Systems and Computer Applications
Principles of Management
Introductory Accounting
Introductory Business Law
Principles of Marketing

<u>Education</u>
Introduction to Educational Psychology
Human Growth and Development

<u>Foreign Language</u>
College French 1 & 11
College German I & II
College Spanish 1 & 11

Humanities
American Literature
Analysis & Interpretation of Literature
College Composition
English Literature

Mathematics
Calculus w/Elementary Functions
College Algebra
College Algebra-Trigonometry
Trigonometry

Sciences
General Biology
General Chemistry

Social Sciences
American Government
American History I & II
Introduction to Psychology
Introduction to Macroeconomics
Introduction to Microeconomics
Introduction to Sociology
Western Civilization I & II

CLEP credit will be awarded according to UNC Charlotte policy in place at the time of evaluation.

The amount of CLEP credit which is applicable to a specific degree program is determined by the department offering the program.

Transfer Credit from Other Institutions. Transcripts are evaluated in the Admissions Office and the results are provided to the applicant and to the major department/college. Determining the applicability of transferred credits to major or program requirements is the responsibility of the department chairperson or program director. General rules governing transfer credit:

1. Only courses taken at a *regionally* accredited institution will be considered for transfer credit.
2. *Provisional* transfer credit may be granted for study at foreign institutions or U.S. institutions which are not regionally accredited, but must be validated by 30 semester hours of successful performance in residence at UNC Charlotte.
3. Courses for which credit is accepted must be appropriate for approved University programs and curricula in which the student is enrolled.
4. Any course from an accredited institution which transfers as a course on the General Education list carrying the "lR" (initiation date retroactive indefinitely) notation will satisfy the goals for which the UNC Charlotte course is applicable. All restrictions that apply to UNC Charlotte courses apply to transfer courses.
5. No credit below *C* level will be accepted; grade points and averages do *not* transfer.
6. Transfer credit is awarded only upon receipt in the UNC Charlotte Admissions Office of an official transcript from the institution where the credit was earned.

Credit for Military Training. the University will approve academic credit for military training equivalent to UNC Charlotte courses required for the students' major, minor or general education requirements and up to three hours of elective credit. The military training credit must be part of the student's first 30 hours at UNC Charlotte and must be approved by the student's major department chair, college dean and the department that offers the course. Documentation of the training, such as a license of completion or notation on the student's DD Form 214, is required. The same requirements apply to transfer or military training credit approved by another institution. Contact the Registrar's Office for further information.

Correspondence and Extension Courses. A limited number of correspondence and/or extension courses may be transferred.

Credit from Two-Year Institutions. The University accepts a maximum of 64 semester hours of credit from two-year institutions for undergraduate students.

Transient Study. Courses undertaken by UNC Charlotte undergraduate degree students at other accredited institutions may be transferred to the University subject to the following regulations:

1. The University is not obligated to accept any credit from another institution unless the student has obtained the *prior approval* of the dean of the college in which he/she is enrolled. A Permit for Transient Study form should be completed and filed in the UNC Charlotte Registrar's Office prior to enrollment at another institution.
2. No credit will be accepted for courses below *C* level for undergraduate students or below *B* level for graduate students.
3. The student must request that an official transcript be mailed to the Registrar's Office upon completion of the course. A form for this purpose is available in the Registrar's Office.

Credit by Examination. A student currently enrolled at UNC Charlotte may pass a specially-prepared challenge examination and receive credit for a University course without having to do the normal coursework. The student contacts the chair of the department in which credit is sought to request administration of an examination. Since it may not be appropriate to award credit by examination for some courses, the decision to offer an examination is that of the department. If the chair authorizes an examination, the student is instructed to pay the required fee for credit by examination and to bring the receipt of payment to the examination. Hours earned through credit by examination will be indicated on the transcript, but no grade points will be awarded. Hours attempted will be assigned equal to the hours earned. Failure on such an examination will incur no grade point penalty or hours attempted. A department may allow a student to take examinations for courses not offered at UNC Charlotte, if it deems it appropriate to do so. No student may challenge a course for which either a passing or failing grade has been received at UNC Charlotte.

GRADUATION

Application for the Degree. Each student should make application for his/her degree on a form obtained from the Registrar's Office no later than the filing date specified in the University calendar. The application must be accompanied by the graduation fee in effect at the time of application. Degrees are awarded at commencement exercises held at the end of the fall and spring semesters;

however, the diploma and transcript will reflect the term in which all requirements were completed.

Teacher Licensure. Students who have completed degree requirements and obtained passing scores on appropriate exit tests (Principles of Teaching and Learning, Praxis II Subject Assessments) must apply for licensure through the Office of Student Academic Services (OSAS) in the College of Education. OSAS will process and submit application packets including Praxis scores, final transcripts, and required fees to the North Carolina Department of Public Instruction (NCDPI). Licenses are mailed directly to applicants by NCDPI.

BACCALAUREATE DEGREE REQUIREMENTS

Credit Hours. The baccalaureate degrees require completion of 120-128 semester hours of credit, including all requirements for a major field of study. Specific requirements for degrees and programs are presented in the *Courses of Study* section of this *Catalog*.

Residence. A student must earn the last 30 semester hours of credit for the bachelor's degree at UNC Charlotte, including the last 12 semester hours of work in the major field and at least six hours of any minor field of study. Exceptions to these hour provisions may be made upon the recommendation of the student's major department and with the approval of the dean of the college of the student's major.

Coursework taken in residence shall be construed to mean work offered by UNC Charlotte and taken in courses on the UNC Charlotte campus or at an approved off-campus center. Credit earned by challenge examinations or other advanced standing examinations cannot be used to meet the residence requirement.

Grade Point Averages. To graduate, a student must have an overall grade point average of at least 2.0 and a grade point average of at least 2.0 in the major and in any minor. Some programs require a higher grade point average. See the *Courses of Study* section of this *Catalog*.

Course Levels. Junior and senior students are required to have the consent of the major department to enroll in any course below the 3000 level not required in their degree program.

General Education. All baccalaureate degrees at UNC Charlotte include a common set of general education requirements designed to develop skills, competencies and learning capacities to achieve the **Goals of UNC Charlotte Education.** These requirements apply to all candidates for baccalaureate degrees with the following exception: students admitted as freshmen prior to summer 1986 or as transfer students prior to summer 1988, who have not been away from the University for a period of 12 months or longer, may meet these requirements or the course requirements specified for their degree in the catalog in effect at the time of their first enrollment as degree students. Students who left the University for a period of 12 months or more must meet the following requirements.

Requests for Exceptions. Requests for exceptions to any aspects of the general education requirements for individual students must be approved by the Vice Chancellor for Academic Affairs in consultation with the Council on General Education. Such exceptions may be requested by completing the Special Request Form, including recommendations of approval by the student's adviser, chairperson and dean, and submitting it to the Registrar's Office.

GOALS OF UNC CHARLOTTE EDUCATION, GENERAL EDUCATION REQUIREMENTS AND APPROVED COURSES

To meet the Goals of UNC Charlotte Education, students engage in a program of general education to develop an understanding of and appreciation for science and technology; literature and the arts; the individual, society and culture; and the interrelationships among these.

Designation of Approved Courses. The courses which satisfy the Goals of UNC Charlotte Education are listed below and also identified in the course descriptions. In addition, a specific section of a course may be designated to meet a goal. The **Schedule of Classes** published for each term contains a listing of courses and sections offered that term to satisfy specific goals. Courses approved to meet goals are designated by the following symbols:

A Arts and Ideas
C Individual, Society and Culture
L Literature or Ideas
O Oral Communication
P Problem Solving
S Science and Technology
V Values
W Writing Intensive
X Cross-Cultural/International Perspective

Courses Approved to Satisfy Two Goals. Generally, a student may use a course to satisfy *only one Goal* even though the course qualifies to satisfy more than one Goal. The only *exceptions to this restriction* concern (Values) GOAL III and Writing Intensive (part GOAL I.) Courses approved to meet the Values or Writing Intensive requirements also can be approved to satisfy another goal. However, a student may not use a course to satisfy more than two goals at the same time even if the course is approved to satisfy more than two goals.

Grading Policy for General Education. A course taken to satisfy a general education requirement must be graded *A, B, C, D, F* unless it is offered only with *Pass/No Credit* grading.

GOAL I. COMMUNICATION

UNC Charlotte graduates should be able to:

- Effectively send and receive in English written and oral messages in different situations for a variety of audiences, purposes and subjects.
- Communicate effectively in a symbolic system of language (other than English) having written, oral or visual components.

Requirements/Approved Courses

- **English 1101 and 1102** Entering Freshmen selected by the Rhetoric and Writing Committee to do so may satisfy this requirement with credit for ENGL 1103, Or, Transfer Students may fulfill the requirement with one of the following: (1) transferred equivalent courses; (2) exemption from first year writing (without credit) at another college or university; (3) 64 or more transferred credit hours; or (4) an A.A., A.F.A., A.S., or bachelor's degree from another institution. Transfer students who have fulfilled only part of the requirement may complete it with either ENGL 1101 or 1102.

- **Oral Communication (O) course**: entering students beginning Fall 1998 must complete at least one course. **Approved courses** are listed in the **Schedule of Classes** for each term.

- **Writing Intensive (W) courses:** six semester hours, including three semester hours at the 3000 level or above and at least three semester hours outside the student's major. **Approved (W) courses** include but are not limited to:

  AAAS 2215, 3692
  AERO 3101
  ANTH 2121, 3601, 3132
  ARCH 2601, 2602, 3050Z
  ARTA 3101, 3600
  BIOL 4111, 5144, 4234
  CEGR 3155, 3255, 3258
  CHEM 3695, 4695
  CJUS 3210
  COMM 3100
  CSCI 3688
  DANC 3110
  ECON 4177
  EEGR 2155, 2156, 3253, 3254
  (four labs satisfy one W goal)
  Engineering Technology Majors:
  (three labs satisfy one W goal)
  CIET 3150, 3151, 3154, 3252, 3253
  ELET 3153, 3156, 3255, 3256, 3257, 3258
  INET 3151, 3251
  MEET 3151, 3152, 3251, 3252
  MFET 3251
  ENGL 2014, 2015, 2105, 2108, 2116, 2126, 3110, 3200, 4204, 4400
  FORL 3050, 3160
  FREN 2209
  GEOG 3115, 3215, 3265
  GEOL 3124
  GERM 3160
  GRNT 3600
  HIST 3150, 3215, 3700, 4000, 4001, 4002
  HLED 3160
  HONR (formerly ARSC) 1702, 3702
  JOUR 2160
  LEGR 3114
  MATH 3163
  MEGR 3171L, 3152, 3251
  MGMT (formerly BUSN) 3160, 3162
  MUSC 3171
  NURS 3252
  PHYS 3285
  POLS 3990, 3220
  PSYC 2102, 3125
  READ 3225, 3255
  RELS 2101, 3207, 3212, 3600, 4201, 4204
  SOCY 3153, 3656
  SOWK 3201
  SPAN 2009, 3009, 3019
  THEA 2218
  TRAN 3274
  WMST 3201
  Other courses designated W

Designated sections only of the following courses are approved to meet Goal I: Writing Intensive (W):

  AAAS 2206
  AMST 3000
  ANTH 1101
  ARCH 3050B, 3050.Z01, 3053, 3144
  ARSC 3000
  BIOL 3215, 3144
  COMM 3050
  GEOG 3000
  HIST 1161, 3241
  HONR (formerly ARSC) 1702, 3700
  PHIL 1105, 2101, 3050
  POLS 1110, 1130, 1150
  PSYC 2120
  RELS 1101, 3000S, 3218, 4000A-E, 4000F, 4000.G, 4000.I
  SOCY 1101, 2090, 2132, 2171, 4172
  THEA 1101

- **Foreign language proficiency through the 1102 or 1202 course level.** Proficiency may be certified by: (1) completion of any French, German, or Spanish course at the 1102 level or above at UNC Charlotte; **OR** completion of any course at the 1202 level or above in Arabic, Chinese, Danish, Greek, Hebrew, Italian, Japanese, Latin, Portuguese, or Russian; (2) transfer of an equivalent course from another college or university; (3) satisfactory performance on a UNC Charlotte Foreign Language Proficiency Exam or on an exam administered by another university and approved by the UNC Charlotte Department of Foreign Languages; (4) presentation of an acceptable score on an approved test in foreign languages, such as AP or CLEP. American sign language may be used to meet this requirement. Students whose native language is not English may satisfy the foreign language requirement by completing ENGL 1102.

  Students placed in FREN/GERM/SPAN 1102 by their performance on a UNC Charlotte Foreign Language Proficiency Exam who complete that course with a grade of B or better will receive three hours of bypass credit for FREN/GERM/SPAN 1101 for six hours in total; and those who placed in FREN/GERM/SPAN 2201 who complete that course with a grade of B or better will receive three hours of bypass credit for FREN/GERM/SPAN 1102, for six hours in total. (Bypass credit is not awarded for FREN/GERM/SPAN 1100.)

Note: All students with certified learning disabilities or with impaired sensory, manual or speaking skills who require special assistance regarding the foreign language requirement should contact the Office of Disability

Services. All other questions regarding the foreign language requirement should be directed to the Department of Foreign Languages.

GOAL II. PROBLEM SOLVING

UNC Charlotte graduates should possess the analytical abilities necessary to:

- Sense, discover and define problems.
- Recognize and understand the use of qualitative and quantitative methods for solving problems and select those appropriate for specific problems.
- Collect and order information.
- See the relationships among phenomena.
- Assess the probable implications of a solution.
- Decide on an appropriate solution.
- Evaluate the problem-solving process.

Requirements/Approved Courses. Problem solving is a goal of all courses taught in the University and it is integrated into all the other Goals of UNC Charlotte Education. Additional requirements:

- **Analytical and quantitative approaches to Goal II problem solving (P) (select one):**

  Six semester hours of mathematics (including STAT/OPRS) **OR**

  Three semester hours of mathematics (including STAT/OPRS) and Logic, PHIL 2105 (3) **OR**

  Three semester hours of mathematics (including STAT/OPRS) and CSCI 1100 or CSCI 1201 and CSCI 1201L.

  Engineering Technology majors should consult their department about using EGET 3171, EGET 3273 or ELET 3124 toward this requirement.

- **Research methods and problem-solving coursework appropriate to the major discipline or field study.** (This is specified by the student's major department.)

GOAL III. UNDERSTANDING VALUES

UNC Charlotte graduates should confront the dynamics of personal and community interrelationships by:

- Recognizing the assumptions, beliefs, and values underlying one's own conduct.
- Recognizing the historical context and assessing the consistency of one's own values.
- Recognizing differences in the assumptions, beliefs, and values underlying the conduct of others.
- Recognizing the implications of decisions made on the basis of values.

Requirements/Approved Courses. Aspects of this goal are addressed by many courses throughout the curriculum and by extracurricular activities offered on and off campus. Specific academic requirements:

- **Values (V) courses:** three semester hours. **Approved courses** include but are not limited to:

  AAAS 3101, 3150
  AERO 3202
  ANTH 1101
  CJUS 2102
  CSCI 3688
  ENGL 3110
  ESCI 2101
  GEOG 3265
  HIST 1100, 2000, 2111
  HONR 3701
  PHIL 3221, 3228, 3231
  POLS 3070, 3115, 3137, 3171, 3173, 3174, 3175
  RELS 1110, 2101, 2104, 2105, 3150, 3207, 4204
  SOCY 1101, 2112, 2132
  Other courses designated V

Designated sections only of the following courses are approved to meet Goal III: Values (V):

AMST 3000
ARCH 3053
POLS 3000
RELS 1101, 3000, 4000D, 4000F
PSYC 2150

GOAL IV. UNDERSTANDING SCIENCE AND TECHNOLOGY

UNC Charlotte graduates should:

- Be conversant with and have had experience in the aims, methods, and principles of scientific and technological endeavors.
- Understand the nature and limitations of the world view given us by sciences.
- Understand the effects of technology in shaping the physical and human environments.

Requirements/Approved Courses: Students are required to **complete one of the following options:**

Option A. *Three Science (S) courses with laboratories including at least one from the Life Sciences and at least one from the Physical Sciences.*

Life Sciences
Biology (BIOL 1110 + Lab)
Physical Anthropology (ANTH 2141 + Lab) **OR** Psychology (PSYC 1101 + Lab)

Physical Sciences
Chemistry (CHEM 1111 + Lab, 1203 (formerly 1103) + Lab **OR** 1251 (formerly 1101) + Lab
Engineering Technology (ELET 3112 + ELET 3156) (*ET majors only*)
Geology (GEOL 1200 + Lab)
Physical Geography (ESCI 1101 + Lab)
Physics/Astronomy (PHYS 1101 + Lab, PHYS 1130 + Lab, PHYS 2101 + Lab, PHYS 2102 + Lab, **OR** PHYS 3000

Students who entered UNC Charlotte before Fall 1993 may substitute one science (S) course with laboratory from three of the following six groups: Biology (BIOL 1110 or 2111); Chemistry (CHEM 1111, 1203 or 1251); Earth Science-Geography (ESCI 1101); Earth Science-Geology (GEOL 1200); Physics/Astronomy (PHYS 1101, 1130, 2101, or 2102); Psychology, Physical Anthropology (PSYC 1101 or ANTH 2141). Engineering Technology students may substitute ELET 3112 and 3156 for one of the three required groups.

Option B. *One of the following approved two-semester sequences of Science (S) courses with laboratories:*

BIOL 1110 and 1115
CHEM 1111 + 1111L and 11112 + 1112L
CHEM 1251 + 1251L and 1252 + 1252L
CHEM 1203 + 1203L and 1204 + 1204L
GEOL 1200 + 1200L and 1210
PHYS 1101 + 1101L and 1102 + 1102L
PHYS 2101 and 2102

GOAL V. UNDERSTANDING THE ARTS, LITERATURE, AND IDEAS

UNC Charlotte graduates should:

- Be conversant with, and have had experience in, the aims and methods of the great intellectual, spiritual, literary, and artistic expressions that have shaped the development of the human imagination.
- Understand the importance that abstract ideas and artistic images have in the process of self understanding and in the shaping of society.

Requirements/Approved Courses:

- **Literature or Ideas (L) courses**: three semester hours. **Approved courses** include but are not limited to:

AMST 3100
ENGL 2101, 2102, 2103, 2104, 2105,2111, 2112, 3103, 3104
FORL 3050
GERM 3050
HIST 2200, 3101, 3102, 3105, 3106, 3150
HONR (formerly ARSC) 1701
PHIL 2101
RELS 1101, 2101, 2102, 2104, 2105,3101, 4218 4110, 4216
SPAN 2009, 3009, 3019
WMST 3201
Other courses designated L

Designated sections only of the following courses are approved to meet Goal V: Literature or Ideas (L):

AMST 3000
RELS 3000, 4000.I

- **Arts and Ideas (A) courses:** three semester hours. **Approved courses** include but are not limited to:

AAAS 2206
ANTH 3020, 3112
ARCH 2111, 2112, 3111
ARTA 1111, 1211, 1212, 2111, 2112, 2113, 3600
DANC 1101, 2110, 2111
ENGL 2106
GERM 3030, 3160
HIST 1115, 3102, 3105, 3106, 3107
HONR (formerly ARSC) 2701
MUSC 1132, 3170
PHIL 3205, 3223, 3225
POLS 3010
RELS 3163, 3212
THEA 1101, 3101, 3102
Other courses designated A

Designated sections only of the following courses are approved to meet Goal V: Arts and Ideas (A):

ARCH 3050
ARTS 3001
FORL 3050 (European Cinema)
HIST 3107

GOAL VI. UNDERSTANDING THE INDIVIDUAL, SOCIETY, AND CULTURE

UNC Charlotte graduates should be able to:

- Understand how institutions operate with societies in both contemporary and historical perspectives.
- Understand internal and external influences which promote and inhibit human action.
- Understand the patterns of change which individuals experience at various points in life.
- Recognize the complex, integrated, and dynamic nature of human behavior and human experience.
- Understand the commonalities, differences, and interdependence among and within societies of the world.

Requirements/Approved Courses: Six semester hours including at least three semester hours with a cross-cultural and/or international emphasis **(X).**

- **Individual, Society and Culture (C) approved courses** include but are not limited to:

AAAS 2201
AMST 3100, 3210
CJUS 1100 (formerly 2100)
ECON 1201,1202
EDUC 2150
ENGL 2101, 2102
GEOG 1105, 2165
GRNT 2100
HONR (formerly ARSC) 3702
HIST 1160, 1161, 2111, 2260, 3241, 3216
PHIL 3226
POLS 1110, 3177
PSYC 1101, 2120, 3116, 3130, 3135, 3151
RELS 2108
SOCY 1101, 2112, 2132
SPAN 3009
WMST 4101
Other courses designated C

Designated sections only of the following courses are approved to meet Goal VI: Individual, Society and Culture (C):

AERO 3201
HONR (formerly ARSC) 3700
AMST 3000P

Cross-Cultural and/or International Emphasis (X) approved courses include but are not limited to:

AAAS 1100, 3101, 3150
ANTH 1101, 2114, 2121, 3020, 3112, 3132, 4010, 4110
ARTA 2111, 2112, 2113
ENGL 2111, 2112, 4146, 3156
FREN 2209

GEOG 1101
GERM 3160
HIST 1100 (formerly 1000), 1115, 1120, 1121, 2206, 2207, 3107
HONR 1702
MKTG 3215
NURS 3252
POLS 1130, 1150
RELS 2102, 3000R, 3150, 3163, 4000F
SPAN 3019
Other courses designated X

Designated sections only of the following courses are approved to meet Goal VI: Cross Cultural and/or International Emphasis (X):

AAAS 3050
ARCH 2111, 2112, 3050, 3111
GEOG 3000
HIST 1115

Study Abroad Option to meet Goal VI (X): Students enrolled in a degree program at UNC Charlotte may satisfy up to six (6) semester hours of the Goal VI (X) requirement through participation in a study-abroad program sponsored, or specifically approved, by the Office of International Programs. Upon successful completion of the approved study abroad program, credit to meet the cross-cultural requirement will be awarded based on the following guidelines:

Cross-cultural Requirement Met

8 weeks or longer of study abroad. Up to six semester hours, based on semester hours earned through study abroad. (Examples: 3 hours earned = 3 hours of the requirement met; 9 hours earned = 6 hours of the requirement met)

Less than 8 weeks. Up to three semester hours, based on semester hours earned through study abroad (Examples: 2 hours earned = 2 hours of the requirement met; 4 hours earned = 3 hours of the requirement met). An additional three hours (to a total of six hours) may also be approved by COGE (on the advice of the Office of International Programs) to satisfy the requirement if the program experience and/or content warrant.

PROGRAMS AND DEGREES OFFERED

Subject Area	Degree(s)	Minor	Teacher Licensure	Other
Accounting	BS MACC			Cooperative Education/ MBA Concentration
African-American and African Studies	BA	•		
Air Force Aerospace Studies (AFROTC)				
American Studies		•		
Anthropology	BA	•	See Social Studies	
Applied Mathematics	MS/PhD			
Applied Physics	BS/MS			
Applied Statistics	MS			
Architecture	BA/BARCH MARCH			
Army ROTC (Military Science)				
Art	BA/BFA		•	Honors
Biology	BA/BS MA/MS	•	•	Honors/ Cooperative Education
Biology with option in Ecology/Environmental Biology	BS			
Biology with option in Medical Technology	BA/BS			
Biotechnology		•		
Birth-Kindergarten Teacher Licensure	BA		•	
Business Administration	BSBA/MBA			MBA Plus Certificate Honors/ Cooperative Education
Chemistry	BA/BS/MS	•	•	Honors
Chemistry with option in Biochemistry	BS			
Chemistry with option in Medical Technology	BA			
Child and Family Development	BA	•		
Civil Engineering	BSCE MSCE			Cooperative Education/ Doctoral Studies*
Civil Engineering Technology	BSET			Cooperative Education

Subject Area	Degree(s)	Minor	Teacher Licensure	Other
Communication Studies	BA	•		
Computer Science	BA/BS/MS	•		Cooperative Education
Counselor Education	MA		•	
Criminal Justice	BA/MS	•		
Dance	BA	•	•	Honors
Earth Sciences	BA/BS	•	•	Cooperative Education
Economics	BA/MS	•	See Social Studies	Cooperative Education/ MBA Concentration Finance Concentration
Education See specific topics: Educational Administration, Elementary Education, Middle Grades, Reading Education, Secondary Education, Special Education, Teaching English as a Second Language, Instructional Technology-Systems	BA/MEd		•	
Educational Administration School Administration	MSA EdD		•	CAS**
Electrical Engineering	BSEE/MSEE PhD			Cooperative Education
Electrical Engineering Technology	BSET			Cooperative Education
Elementary Education	BA/MEd		•	
Engineering See specific topic areas: Civil Engineering, Electrical Engineering, Mechanical Engineering	Baccalaureate, Master's, PhD			Cooperative Education
Engineering Technology See: Civil Engineering Technology, Electrical Engineering Technology, Manufacturing Engineering Technology, Mechanical Engineering Technology	BSET			Cooperative Education
English	BA/MA	•	•	Graduate Certificate in English Language Studies
Finance	BSBA			Cooperative Education/MBA Concentration
Foreign Languages French, German, or Spanish	BA	•	•	Certificate in Translating
French	BA	•	•	Certificate in Translating
Geography	BA/BS/MA	•	See Social Studies	Cooperative Education

Subject Area	Degree(s)	Minor	Teacher Licensure	Other
Geology	BS			Cooperative Education
German	BA	•	•	Certificate in Translating
Gerontology	MA	•		Graduate Certificate
Health Administration	MHA			
Health Fitness	BS			
Health Promotion	MEd			Athletic Training Endorsement
History	BA/MA	•	•	Honors
Information & Technology Management				MBA Concentration
Instructional Systems Technology	MEd		•	
International Business	BSBA			
International Studies		•		
Journalism		•		
Liberal Studies	MA			
Management	BSBA			MBA Concentration
Management Information Systems	BSBA			
Marketing	BSBA			MBA Concentration
Manufacturing Engineering Technology	BSET			Cooperative Education
Mathematics, Applied	MS/PhD			
Mathematics	BA/BS/MA	•	•	Honors/ Cooperative Education
Mathematics Education	MA		•	
Mechanical Engineering	BSME, MSME/PhD			Cooperative Education
Mechanical Engineering Technology	BSET			Cooperative Education
Middle Grades Education	BA/MEd		•	
Military Science Area (Army ROTC)				
Museum Studies		•		
Music	BM	•	•	Honors
Nursing	BSN,MSN, MSN/MHA			

Subject Area	Degree(s)	Minor	Teacher Licensure	Other
Operations Management	BSBA			
Performing Arts Dance, Theater	BA	•	•	Honors
Philosophy	BA	•		
Physics	BA/BS	•		
Physics, Applied	BS/MS			
Political Science (See also Public Administration)	BA	•	See Social Studies	
Psychology	BA/BS/MA	•	•	Honors
Public Administration	MPA			
Reading Education	MEd		•	
Religious Studies	BA	•		
School Administration	MSA		•	CAS**
Secondary Education English, History, Mathematics	MEd		•	
Social Studies Anthropology, Economics, Geography, History, Political Science, Sociology (Contact the Coordinator of Licensure in the College of Education for more information.)			•	
Social Work	BSW	•		
Sociology	BA/MA	•	See Social Studies	
Spanish	BA	•	•	Certificate in Translating
Special Education	BA/MEd		•	Graduate Certificate in Supported Employment and Transition
Statistics, Applied	MS			
Teaching English as a Second Language	MEd		•	
Theater	BA	•	•	Honors
University Honors				Honors
Western Antiquity & Classical Languages		•		
Women's Studies		•		

* The University of North Carolina at Charlotte participates in an interinstitutional degree program at the doctoral level: Doctor of Philosophy (Ph.D.) in engineering. The degree is conferred by North Carolina State University.

** Certificate of Advanced Study licensure is based upon the completion of approved programs of study beyond the master's degree.

UNDERGRADUATE PROGRAMS
College of Architecture

Dean: Professor Hight; *Chair*: Associate Professor Sauda; *Professors*: Melaragno, Mitchell, Walters; *Associate Professors*: Asbel, Benzing, Brentrup, Gallis, Heath, Lambla, MacLean, Morgan, Nelson, Ryan, Swanson, Swisher, Weiss, Wong; *Assistant Professors*: Anderson, Carlson-Reddig, Gray, Iliescu, Siegal; *Senior Lecturer*: Randle; *Part-time Lecturers*: Egan, Gaddy, Preiss

Mission. The mission of the College of Architecture is to further the discourse between the theory and practice of architecture, by the education and training of students, the work and research of the faculty, and ongoing engagement with the University, the profession, and the community. Architecture in the narrow sense includes important public monuments and in the broad sense the constructed environment at all scales.

To prepare undergraduate students to become future community and architectural leaders, the College of Architecture seeks to provide both a liberal and a professional education based on a holistic view of the built environment. The studio/seminar sequence in the Core Program emphasizes both writing and making to introduce students to alternative and complementary methods of investigating problems. The Professional Track in the Advanced Program culminates in a thesis emphasizing self-direction and individualized instruction.

Admission. Admission to the College is selective, and involves an additional process after acceptance by the University. Applicants to the College are asked to submit additional material and a personal statement to the College. Based on evaluation of this information, candidates may be invited for interview.

Core Program. All students in the College complete a three-year core sequence of courses designed to provide a solid understanding of fundamental issues, knowledge and skills. These courses include a series of coordinated studios and seminars, a four-semester sequence of architectural history, and two semesters of building science. In the spring semester each rising fourth year student completes an Individual Study Plan including a Statement of Intention and a selection of courses to complete requirements for their chosen track in the Advanced Program. Students planning to choose the Professional Track select a Thesis Adviser from the COA faculty to serve as their academic counselor for completion of the Individual Study Plan and to advise them through the Thesis process.

Advanced Program. The College offers two advanced program *tracks,* the Professional Track (five years total) and the Self-Directed Study Track (four years total). The **Professional Track** leads to the **Bachelor of Architecture** degree which requires a total of 158 credit hours. This five-year program provides the professional degree accredited by the National Architectural Accreditation Board (NAAB). Students in this program also are awarded a Bachelor of Arts degree in Architecture at the end of four years. Students in the Professional Track are automatically admitted into the fifth year of the program when they have completed all course requirements through the fourth year and have met College GPA requirements for the fifth year. Students who successfully complete the fifth year are awarded the Bachelor of Architecture degree.

The College offers a **one-year Bachelor of Architecture program** for students who have an architectural or environmental related degree from another NAAB accredited institution. The program requires 30 credit hours, including 7 hours of architectural studio, 14 hours of other architectural courses and 9 hours of general studies. No transfer credit is accepted for this program.

The Self-Directed Study Track leads to the Bachelor of Arts degree with a major in Architecture which requires a total of 128 credit hours. The fourth-year course requirements for this track differ substantially from those required in the Bachelor of Architecture program. This degree is intended for students not continuing to the fifth-year professional degree who choose to augment their architectural studies with coursework from other University departments in their fourth year, double major or minor in other disciplines, or prepare to pursue graduate studies in related fields (such as, planning, urban design, landscape architecture, or architectural history).

Academic Standards. Following are specific academic standards for each degree program:

B.A. degree in Architecture: One grade of *D* in a studio is permissible. Any grade of *D* in a subsequent studio will require repeating the course. Any student receiving less than a grade of *C* when repeating a studio course will be expelled from the COA. To graduate, an overall grade point average of 2.0 must be achieved in all courses offered by the College.

Bachelor of Architecture degree: A grade of *C* is the minimum passing grade in studio, ARCH 4104. Any student receiving less than a grade of *C* when repeating a studio course will be expelled from the COA. An overall grade point average of 2.5 must be achieved in fifth-year coursework offered by the College in order to graduate.

Areas of Academic Focus

The Architectural Studio/Seminar: Providing both analytical and synthetic experiences and the opportunity to pursue intense study of physical-environmental related subject(s), these courses link the humanistic, physical phenomena, social-psychological, behavioral and perceptional studies.

The Architectural Technology Courses: These provide a basic quantitative and qualitative behavioral understanding of structural and environmental control systems.

The Architectural Lecture/Seminar Electives: These courses develop understanding of architectural control systems.

The Architectural History Lectures develop an understanding of the relationships between culture and its physical manifestations.

Independent Studies: When appropriate, a student may pursue a self-directed, faculty-approved study of a particular, significant architectural topic or subject.

General University Requirements and Directed Electives: Courses to meet the University's general education requirements and elective studies are included in a student-selected, faculty-approved plan of study.

Advising: The advising program consists of three tiers: Staff Academic Adviser, Core and Development Academic Advisers, and faculty career advisers.

Dual Degree/Major Option: It is possible for students to pursue a double degree or major program after the freshman year. Thus, in addition to architecture, a student may pursue major study in a discipline such as history, engineering, business management, or social science. Any arrangement must meet the University and College requirements, be structured in consultation with a faculty adviser, and be approved by the Dean.

Study Abroad Program: Arrangements have been made for students to study architecture for one or two semesters with the University of Copenhagen, Denmark; Kingston University, London; and St. Andrews, Scotland. The College also conducts summer programs in Italy and Spain.

THE CORE PROGRAM

First Year

ARCH 1105 5
ARCH 1601 2
MATH 1103 (GOAL II) 3
ENGL 1101 (GOAL I) 3
PHYS 1101 (GOAL IV) 4

ARCH 1106 5
ARCH 1602 2
GOAL II 3
ENGL 1102 (GOAL I) 3
GOAL III* 3

Second Year

ARCH 2105 5
ARCH 2601 (GOAL I: W) 2
ARCH 4211 (GOAL V: A) 3
General Elective* 3
GOAL IV 4

ARCH 2106 5
ARCH 2602 (GOAL I: W) 2
ARCH 4212 (GOAL VI: X) 3
General Elective* 3
Foreign Language 4

(Academic Counseling Review)

Third Year

ARCH 3101 5
ARCH 3141 3
ARCH 4213 3
Foreign Language 4

ARCH 3102 5
ARCH 3142 3
ARCH 4214 3
GOAL I (W) 3

(Individual Study Plan)

THE ADVANCED PROGRAM: PROFESSIONAL TRACK

Fourth Year

ARCH 4101 5
ARCH 3143 3
ARCH Elective* 3
GOAL VI (C) 3

ARCH 4102 5
ARCH 3144 3
General Elective* 3
GOAL V (L) 3

Bachelor of Arts degree in Architecture: 128 hours

Fifth Year

ARCH 4111 6
ARCH Elective 3
General Elective* 6

ARCH 4104 7
ARCH 4112 2
ARCH or General Elective 3
PHIL 3225 (or approved alternate) 3

Bachelor of Architecture: 30 hours

THE ADVANCED PROGRAM: SELF-DIRECTED STUDY TRACK

Fourth Year

ARCH 3000 level** 5
Directed Elective** 12

ARCH 3000 level** 5
Directed Electives** 12

Bachelor of Arts in Architecture: 128 hours

**Courses to be selected in accordance with program of study developed with and approved by faculty adviser.*

***Total credit hours must equal 34 for fourth year. If the Architecture course selected is for less than 5 credit hours, student must complete additional directed elective hours to equal a total of 34 credit hours.*

College of Arts and Sciences

Dean: Professor Lyons; *Associate Dean:* Professor Perzel; *Director of Sponsored Research:* Lesley A. Brown

Objectives. The College of Arts and Sciences, largest of the University's six colleges, consists of 19 departments and six programs which share basic educational values and academic aspirations. The primary mission of the college is threefold: 1) the provision of programs of study and instruction in the Arts and Sciences to qualified undergraduate and graduate students; 2) the advancement of the Arts and Sciences through the scholarly activity of the faculty; and 3) the provision of service to the University and general public.

The liberal arts are the core of the University's educational program, both for students majoring in Arts and Sciences and for students majoring in professional degree programs. As a result, courses offered within the College of Arts and Sciences are frequently those designated to satisfy university general education requirements (see *General Education Requirements* for all Baccalaureate Degrees).

Organization. The College of Arts and Sciences includes the Departments of African-American and African Studies; Art; Biology; Chemistry; Communication Studies; Criminal Justice; Dance and Theatre; English; Foreign Languages; Geography and Earth Sciences; History; Mathematics; Music; Philosophy; Physics; Political Science; Psychology; Religious Studies; and Sociology, Anthropology and Social Work. Interdisciplinary programs in American Studies, Gerontology, Liberal Studies, University Honors, and Women's Studies are also part of the College of Arts and Sciences.

Programs. Baccalaureate degrees are offered in all departments, and in Human Services, and minors are available in the following programs: African-American and African Studies, American Studies, Anthropology, Biology, Communication Studies, Criminal Justice, Dance, Earth Sciences, English, French, Geography, German, Gerontology, History, Journalism, Mathematics, Museum Studies, Music, Philosophy, Physics, Political Science, Psychology, Religious Studies, Social Work, Sociology, Spanish, Theatre and Women's Studies. Medical technology options are available in Biology and Chemistry.

The following graduate degrees are offered by the College of Arts and Sciences: Master of Arts degree with majors in Biology, English, Geography, Gerontology, History, Liberal Studies, Mathematics, Mathematics Education, Psychology, and Sociology; Master of Science degree with majors in Biology, Chemistry, Criminal Justice, Physics, and Statistics; Master of Public Administration; and a Ph.D. degree in Applied Mathematics.

Although faculty within the College are committed to departmentally-based programs, increased emphasis is being placed on providing strong interdisciplinary programs. The College also strives to promote inter-cultural understanding through its curriculum, as well as through student exchanges and travel opportunities.

Advising Center. The College of Arts and Sciences administers an advising center for students who have not selected a major. Students admitted to the University who have not determined their career goals are urged to seek assistance from the staff of the Advising Center. Any student, regardless of major, is encouraged to consult with these advisers to clarify academic regulations.

Since all students entering the University must meet the same general education requirements regardless of major, it is appropriate to concentrate on the completion of those requirements before committing to a specific major. Undeclared students have time to enroll in courses in several disciplines, which allows them to make a more informed judgment about future career decisions. Advisers have a broad working experience with the requirements for majors, and offer assistance as students search for the education choice best suited to their individual needs.

Experiential Learning Opportunities. Students are encouraged to participate in professional work experiences in support of their academic and career development through the cooperative education and internship programs offered to students in the College. The College is working with the University Career Center to expand experiential learning offerings to enable more students to graduate with career related experience. For more information about experiential learning programs, contact the University Career Center.

Cooperative Education involves professionally related, paid work experiences in multiple semesters. It does not offer academic credit, but it is noted on the student's transcript. To participate in this program, students must have a minimum GPA of at least 2.5, meet specific departmental requirements, and pay a participation fee. Approval for enrollment must be arranged before the student begins the work experience. Most students begin this program during their junior year; transfer students must complete one semester at UNC Charlotte before making application for the program. Students maintain full-time student status during their co-op work semesters.

Internships usually involve one semester of a professional experience that allows a student to test his or her career options. Academic requirements for participation vary by department. Typically, a GPA of at least 2.5 is required. With faculty approval, students may receive academic credit for their work experience; non-credit internships are available through the University Career Center. All internships must be arranged in advance.

49erships are non-credit internships for students, especially in their sophomore or first semester junior year, to explore career fields and gain experience. They are arranged through the University Career Center, require at least 80 hours, and may be paid or unpaid experiences. Participation is part-time in the fall and spring and either part-time or full-time in the summer. Students must maintain a 2.0 GPA and full-time status to participate.

Department of African-American and African Studies

Chairperson and Frank Porter Graham Professor: Azevedo; *Associate Professors:* Ojaide, Ruiz; *Assistant Professors:* Crawford, Walker; *Adjunct Assistant Professor*: Davis

The African-American and African Studies program addresses itself to the experience of peoples of African descent on the continent of Africa and in the diaspora, particularly in the United States. It provides a coherent focus on the history, economy, politics, literature, religion and culture of black people throughout the world and their interaction with the rest of humankind. Its interdisciplinary approach, drawing from the experience of faculty trained in the areas of African-American and African Studies, presents a stimulating diversity of perspectives integrated into a totality not available in other disciplines, programs or departments. The curriculum is designed to provide a useful educational experience and academic skills for students who wish to consider graduate study or professional school and pursue careers in community development agencies; federal, state and city civil service; business; museums and archives; and diplomatic or foreign service; as well as research, journalism, international organizations and teaching.

The goals of the Department of African-American and African Studies are:

1. To provide and preserve knowledge with purpose and direction about the aggregate experience of peoples of African descent by offering a Bachelor of Arts degree in African-American and African Studies and courses in the field to the University community and the public.
2. To foster intercultural understanding, expose and correct biased scholarship, and dispel myths and stereotypes through course content, programs, exchanges and cultural interaction.
3. To provide a cultural background (through courses, advising and other meaningful activities) supportive to students, particularly African-American students, in moving toward personal growth and self-awareness.
4. To provide general and specific academic skills to majors and non-majors through courses and activities that promote research, writing, reading and effective communication.
5. To promote an African-American and African perspective that will foster a political consciousness about the common bond uniting blacks in the diaspora and the African continent.
6. To prepare and assist students for career choices in life and graduate and professional schools through exposure to relevant experiences, courses and the demands of the working world.
7. To establish and maintain the Department's interdisciplinary and intercultural nature through cooperative arrangements with other academic departments and civic and cultural institutions.
8. To generate new knowledge and paradigms about the African-American and African experience through research and publication and constant communication with similar programs.
9. To promote faculty development by providing required financial means, time, resources and proper environment to accomplish this end.

Study Abroad. Students may have an opportunity to travel, work and study abroad in an exchange program through an African university, the Peace Corps, and Operation Crossroads.

BACHELOR OF ARTS

Students interested in the African-American and African Studies major leading to a B.A. degree are required to complete a minimum of 30 credit hours in the area of African-American and African Studies, chosen from AAAS 1100, 1111, 1112, 1103 or 1104, 2203, 2204, 2205, 2206, 3290, 3601 and 3990. Students may not graduate without completing AAAS 1100, 1111, 1112, 3290, and 3601. Students are strongly encouraged also to take AAAS 2201. In order to acquire experiences to enhance their career choices, students majoring in African-American and African Studies are recommended to pursue a double major in related areas such as history, political science, sociology, religious studies, anthropology and psychology. Furthermore, students have the option to concentrate either in the African-American or the African dimension of the program.

The required junior research methods and senior seminar courses introduce students to research methodology and an in-depth probe into the themes and theories of African-American and African Studies. During the senior year, with the instructor's assistance, students design and work on a major project known as Project Demonstrating Excellence (PDE). Using library, archival or community resources, students demonstrate practical mastery and synthesis of the skills and knowledge acquired through the major courses of study. Consult the Department of African-American and African Studies for a Suggested Schedule to complete the B.A. degree with a major in African-American and African Studies.

Senior projects may require student involvement in community agencies such as the African-American Cultural Center, the Greenville Center, the Mechanics and Farmers Bank, the Metrolina Association for the Blind, Planned Parenthood, and the Charlotte Post.

MINOR

A minor in African-American and African Studies consists of a minimum of 18 semester hours: six hours each at the 1000 level, the 2000 level and the 3000 or above level. Required courses are AAAS 1100, a 2000 level course in the African diaspora component and a course in the continental component of the department's program. A minimum GPA of 2.0 in the hours attempted for the minor is required. AAAS 3895 shall not count towards the minor.

American Studies

INTERDISCIPLINARY STUDIES

Coordinator: Professor West

American Studies is an interdisciplinary program designed to develop in-depth knowledge of American society, past and present. Drawing its curriculum from approved classes in other departments and its own core courses, the program weaves traditionally divergent disciplines together so that students gain a broad understanding of American life and culture. The American

Studies program is open to students of all majors. Students may complete the program by fulfilling requirements for the minor.

AMERICAN STUDIES MINOR

A minor in American Studies consists of 18 semester hours: six hours of American Studies courses including AMST 3100, and 12 semester hours of American Studies courses or approved American-content courses from other departments. A maximum of six of these hours may be in the student's major. All students must have a grade point average of at least 2.0 in courses applied to the minor.

The following courses have been approved for the minor. Because additions and deletions are made to correspond to current University offerings, students are advised to consult with the Coordinator. Other classes that do not appear on the list, especially topics and independent study courses, may be approved if they are pertinent to the student's program and deal with an American topic. **Courses with an asterisk are especially recommended.*

Anthropology: 2112, 2152
Arts: 3117, 3119
English: 2104, 3141, 3142, 3143, 3144, 3145, 3146, 3147, 3148, 3149, 3155, 4141, 4145
History: 1160,1161, 2000, 2101, 2120, 3216, 3201, 3202, 3211, 3212, 3213, 3214, 3241, 3242, 3252, 3256, 3281, 3288
Economics: 1101, 2101, 2102, 3131, 3170
African-American and African Studies: 1101, 1102, 1111, 2203, 2204, 2215, 3050, 3101, 3179
Philosophy: 3050, 3217*
Religious Studies: 2108, 3135, 3137
Criminal Justice: 3102, 3110, 3120, 3121, 3140, 3141, 3150, 3151,
Geography: 2155*, 2160, 3100, 3105, 3110
Music: 1133, 1134
Political Science: 1110*, 3010, 3101, 3103, 3104, 3105, 3109, 3110, 3111, 3112, 3113, 3114, 3115, 3116, 3117, 3118, 3119, 3121, 3124, 3126, 3157
Sociology: 2112, 2132, 2163, 2171, 3110, 3125, 4124, 4125, 4632
Women's Studies: 1101

Department of Art

Chair: Professor Kovach; *Professors*: Anderson, MacKillop, Strawn; *Associate Professors*: Brenner, Hudson, Kampen, Tite; *Assistant Professors*: Bezner, Franki, Hoover, Shumaker, Tweedy; *Lecturer:* Hawthorne

The Department of Art offers a diverse and comprehensive program leading to a Bachelor of Fine Arts, a professional degree, and a Bachelor of Arts, a liberal arts degree in art. The curriculum provides studio concentrations in drawing, painting, printmaking, photography, graphic design, illustration, fibers, ceramics, and sculpture, in addition to a concentration and minor in art history and teacher licensure in art.

Members of the studio faculty are well recognized professional artists, active in their fields of specialization. A diversity of viewpoints and educational training among faculty members encourages students to investigate and appreciate different forms of art expression.

The required study of art history offers a key to understanding the evolution of civilization and the development of human creativity. As a discipline, art history encourages appreciation of individual works of art and instills a vivid awareness of the social and historical context in which these works were produced.

The Art program addresses the needs of students working to become exhibiting artists, art teachers or scholars generally educated in the arts. It also prepares students for a wide range of career choices in art-related professions. The program is structured upon the following premises:

- Students need an awareness of the common core of historical and theoretical knowledge in the arts.
- Students need a basic level of skill and aesthetic sensitivity in a variety of studio disciplines.
- Students need in-depth knowledge in a personal area of specialization.

The undergraduate program in Art develops within students the ability to identify artistic problems and to solve them; it leads to an awareness of the interrelatedness of all forms of visual knowledge; and it inspires a creative philosophy unique to each individual bolstered by the critical self-motivation necessary for success.

Concentrations may be earned in Art History, Painting, Fibers, Ceramincs, Drawing, Graphic Design, Illustration, Printmaking, Photography, Sculpture, or in a Cross-Disciplinary Concentration. Concentrations for the BA degree require 12 semester hours; those for the BFA degree require 18-24 semester hours. See departmental advising sheets for details.

Students may receive a dual concentration by completing the concentration requirements in two areas. This may require additional units for the completion of graduation requirements.

Courses designated "for non-majors only" cannot be counted toward the total numbers of units required for the major. Students must receive a grade of C or better in all courses applied to the major.

Advisory System. Art students initially are assigned an adviser. Upon selecting a concentration, they may change to an adviser in the area of concentration. In addition to meetings required for preregistration, the student may ask the adviser for any art program information. Advising sheets listing all curriculum requirements are available in the Department office.

BACHELOR OF ARTS (B.A.)

General Requirements. All students majoring in art are required to complete courses which satisfy the six Goals of UNC Charlotte Education listed earlier in this Catalog.

I. Core (42)

ACADEMIC COURSES
ARTA 1211 Art History Survey I (3)
ARTA 1212 Art History Survey II (3)
ARTA xxxx Art History Elective (3)
ARTA 2212 Art History Methods (3) **or**
ARTA 3211 Contemporary Art History
ARTA 3600 Senior Seminar (3)

FOUNDATION STUDIO COURSES
Students may not go on to the second level of any art class until ALL foundation courses have been met or are taken concurrently.
ARTB 1201 2D Design (3)
ARTB 1202 3D Design (3)
ARTB 1203 Drawing I (3)
ARTB 1205 Figure Drawing I (3)

MEDIA BREADTH
Students may not take a third class in their concentration until ALL media breadth courses have been met or are taken concurrently.
2D Breadth: 1 course from 3 areas other than the concentration (9)
- Painting
- Photo
- Printmaking
- Graphic Design
- Illustration
- Electronic Media

3D Breadth: 1 course from 3 areas other than the concentration (6)
- Sculpture
- Ceramics
- Fiber
- Jewelry/Metalsmithing

II. Concentration (12)

A minimum of 4 courses in one area as directed by discipline. (equivalent to 2 yrs. in discipline)

Total 54

BACHELOR OF FINE ARTS (B.F.A.)

General Requirements. All students majoring in art are required to complete courses which satisfy the six Goals of UNC Charlotte Education listed earlier in this Catalog.

I. Core (42)

ACADEMIC COURSES
ARTA 1211 Art History Survey I (3)
ARTA 1212 Art History Survey II (3)
ARTA xxxx Art History Elective (3)
ARTA 2212 Art History Methods (3) **or**
ARTA 3211 Contemporary Art History
ARTA 3600 Senior Seminar (3)

FOUNDATION STUDIO COURSES
Students may not go on to the second level of any art class until ALL foundation courses have been met or are taken concurrently.
ARTB 1201 2D Design (3)
ARTB 1202 3D Design (3)
ARTB 1203 Drawing I (3)
ARTB 1205 Figure Drawing I (3)

MEDIA BREADTH
Students may not take a third class in their concentration until ALL media breadth courses have been met or are taken concurrently.
2D Breadth: 1 course from 3 areas other than the concentration (9)
- Painting
- Photo
- Printmaking
- Graphic Design
- Illustration
- Electronic Media

3D Breadth: 1 course from 3 areas other than the concentration (6)
- Sculpture
- Ceramics
- Fiber
- Jewelry/Metalsmithing

II. Concentration (18)

A minimum of 6 courses in one area as directed by discipline. (equivalent to 3 yrs. in discipline)

III. Art Electives (18)

Up to 18 hours depending on concentration requirements

Total 78

Teacher Licensure. The department offers a program of art and professional education courses to prepare students for K-12 teacher licensure in North Carolina. Licensure applications are the responsibility of the student and the Office of Student Academic Services in the College of Education.

Students planning to specialize in art education should apply through the Coordinator of Art Education during the first semester of the sophomore year to obtain appropriate advising. Criteria for admission to the art education program are:

1. Overall GPA of 2.75.
2. Successful completion of the Praxis I: Pre-Professional Skills Tests.
3. Completion of EDUC 2100 and SPED 2100 with grades of C or better.

The student is admitted to student teaching in art through a second application process which requires the following criteria:

1. Overall GPA of 2.75.
2. A GPA of 2.75 in education course sequence and area of specialization (art).

3. Grades of C or above in all courses required for licensure.
4. Recommendation of the Coordinator of Art Education. A student not recommended by the Art Education Coordinator may appeal to the Art Department Chair who will appoint a three-member faculty review committee to interview and evaluate the student. The decision of this committee is final.

Post-baccalaureate students with a degree in art may meet competencies for K-12 art licensure following the same program worksheets. They should apply through the Coordinator of Art Education when they are admitted to the University.

Students who complete all the requirements for teacher licensure in art will be considered as having completed a second concentration in art education in the B.A. or B.F.A. programs.

Requirements. Students seeking teacher licensure in art must complete B.A. or B.F.A. degree requirements and in the process must complete the following courses:

Media Breadth: (1 course from each of the following areas as designed on program worksheet)

Ceramics	Painting
Electronic Media	Photo
Fiber	Printmaking
Graphic Design	Sculpture/Jewelry

Art Education Curriculum:

ARTE 3121. Art Education Methods I (3)
ARTE 3122. Art Education Methods II (3)
ARTE 3467. Student Teaching/Seminar: K-12 Fine and Performing Arts: Art (15)

Education Curriculum:

EDUC 2100 Introduction to Education and Diversity in Schools (C) (3)
EDUC 2150 Human Development Across the Life Span (3) **or**
MDSK 3160 Learning and Development: Birth through Adolescence (3)
SPED 2100 Intro. To Students with Special Needs (2)

Note: Concentration requirements may include one course from the media breadth. Some concentrations require more hours than others.

Minor in History of Art

A minor in the History of Art consists of 24 semester hours, including the same requirements as the B.A. degree concentration in History of Art (information on the History of Art Concentration can be found in the Department office). The student must achieve a GPA of 2.5 or above in the minor.

SUGGESTED SCHEDULE FOR THE FIRST TWO YEARS OF THE ART MAJOR

Freshman Year

ARTB 1201 or 1202	3
ARTB 1203	3
ARTB 1211 (A)	3
GOAL I: Foreign Language	4
GOAL I: ENGL 1101	3
ARTX 1201 or 1202	3
ARTX 1205	3
ARTX 1212	3
GOAL I: Foreign Language	4
GOAL I: ENGL 1102	3

Sophomore Year

ARTX xxxx 2D Media Breadth Studio	3
ARTX xxxx 2D Media Breadth Studio	3
ARTX xxxx 3D Media Breadth Studio	3
GOAL II: Problem Solving (P)	3
GOAL III: Values (V)	3
ARTX xxxx 2D Media Breadth Studio	3
ARTX xxxx 3D Media Breadth Studio	3
ARTX xxxx Major Concentration Studio	3
GOAL II: Problem Solving (P)	3
GOAL I: Writing Intensive (W)	3

A list of required courses for each concentration and art teacher licensure are available in the Department Office. Students planning to become art teachers may follow a different schedule than the above and must consult the department upon entering the University.

Note: Students must enroll in studio art courses every semester, beginning in the freshman year or expect a delay in completing graduation requirements. Students must not postpone electing studio art courses until their General Education Requirements are met, but instead spread these required courses over a four-year period.

Department of Biology

Chairperson: Professor Clemens; *Professors*: Barden, Edwards, Leamy, Menhinick, Oliver, Reynolds, Schneider, Thomas; *Professors Emeritus*: Hechenbleikner, Hildreth, Matthews; *Associate Professors*: Hudson, Huet-Hudson, Langsam, Mellichamp, Ostrowski, Peters, Steck, Travis; *Assistant Professors*: Bashor, de Silva; *Lecturers:* Bryska, Rowe, Simpson, Stickney

The biological sciences are important in many areas of human endeavor encompassing wide-ranging career opportunities in medicine and allied health professions, education, research and industry. The Department of Biology offers undergraduate programs leading to the Bachelor of Arts degree and the Bachelor of Science degree. Both provide a firm foundation in the basic principles of biology as background to understanding the biological world, and as preparation for many technical careers, careers in education, or for advanced studies in academic or professional programs. The minor in biology is offered for students who desire a background in biology as an adjunct to their major.

Biology programs can be tailored to fit the individual student's needs and interests. Through course selection, the student can emphasize many areas within biology: plant sciences, including horticulture, systematics, and plant physiology and ecology; animal sciences, that include behavior, morphology and physiology; microbial science, including virology and microbial physiology;

cellular/molecular studies, such as genetics, development, immunology and biotechnology; and environmental sciences, including ecology and evolution. Opportunities for individual activity occur at every level from undergraduate research and tutorials with faculty in the junior and senior courses to honors research projects in the senior year.

A program in medical technology is offered in cooperation with other institutions.

Teacher Education. The department, in collaboration with the Department of Middle, Secondary, and K-12 Education, offers a program of biology and professional education courses to prepare students for 9-12 teacher licensure in North Carolina. Students interested in biology education should declare this interest during the first semester of the sophomore year to obtain appropriate advising. Licensure applications are the responsibility of the student and the Office of Student Academic Services in the College of Education.

BACHELOR OF ARTS

A major in biology leading to the B.A. degree consists of 32 semester hours of biology including: (1) a core sequence of Plant (BIOL 1222 +Lab), Animal (BIOL 1233 +Lab), and Cell (BIOL 2111 +Lab); (2) three area courses: Genetics (BIOL 3166), Ecology (BIOL 3144), and Physiology (BIOL 3272 or 3273); and (3) seminar (BIOL 4600). The B.A. degree requires a total of five biology laboratories. Additional requirements are CHEM 1251 (formerly CHEM 1101), 1252 (formerly CHEM 1102), and 2131, with associated labs, and six semester hours of mathematics (including STAT 1221). Care should be taken in selecting electives to ensure completion of University requirements.

BACHELOR OF ARTS WITH AN OPTION IN MEDICAL TECHNOLOGY

Upon satisfactory completion of training at Schools of Medical Technology at Carolinas Medical Center or other regional hospitals that are affiliated with UNC Charlotte in the medical technology program, a student may receive a B.A. degree in biology from UNC Charlotte. (It is possible to obtain a B.S. degree by careful planning with the adviser, although a B.S. degree will typically require a longer period of time than will the B.A. degree). The student must take Animal (BIOL 1233,1233L), Cell (BIOL 2111, 2111L), Genetics (BIOL 3166), Microbiology (BIOL 4250), Immunology (BIOL 4251), Animal Physiology (BIOL 3273), Seminar (BIOL 4600), and 16 hours of chemistry [CHEM 1251, 1251L (formerly CHEM 1101, 1101L), 1252, 1252L (formerly CHEM 1102, 1102L), 2131, 2131L, and chemistry elective]; have a total of 24 hours of biology and a total of four laboratories in biology at UNC Charlotte; and have a 2.0 grade point average overall and in the major at the end of the junior year. The student must have a total of 90 hours including 24 hours of biology at UNC Charlotte; the remaining 30 hours and eight hours of biology will be accepted from the school of medical technology. The final 30 hours counted toward the degree and the last eight hours counted toward the major prior to entering a school of medical technology must be taken at UNC Charlotte. Gaining admission to the school of medical technology is the responsibility of the student. Additional information is available from the Department of Biology.

BACHELOR OF SCIENCE

In addition to the 32 hours of biology required for the B.A. degree, a student working toward the B.S. degree is required to take 12 additional hours in biology for a total of 44 hours, two additional laboratories for a total of seven, CHEM 2132 with associated laboratory, PHYS 1101, 1102 and associated labs, and three additional hours of mathematics (including STAT 1221) or computer science (excluding CSCI 1101) for a total of nine hours.

BACHELOR OF SCIENCE WITH AN OPTION IN ECOLOGY/ENVIRONMENTAL BIOLOGY

A B.S. degree in biology with an option in ecology/environmental biology consists of 50 hours of biology including all required courses for a B.S. degree in biology plus Ecology Laboratory (BIOL 3144L), Biometry (BIOL 4121), and Environmental Problems (BIOL 4000) or The Environmental Dilemma (ESCI 2101). Each student must take at least four courses in one of the following subareas of environmental biology: Plant Ecology, Animal Ecology, Environmental Assessment, Aquatic Ecology, and General. The student should consult the biology department for the list of appropriate courses within each subarea. Students are also recommended to take ESCI 1101 or 1200 and Investigations in Biology (BIOL 3900) under the direction of one of the environmental biology faculty. Students are responsible for all Chemistry, Mathematics and Physics requirements for a B.S. in biology.

BACHELOR OF SCIENCE WITH AN OPTION IN MICROBIOLOGY

A major in biology leading to a B.S. degree with an option in microbiology consists of 46 hours of biology including: (1) a core sequence of Plant (BIOL 1222 and 1222L), Animal (BIOL 1233 and 1233L), and Cell (BIOL 2111 and 2111L); (2) three area courses: Genetics (BIOL 4166), Ecology (BIOL 3144), and Physiology (BIOL 3272 or 3273); (3) seminar (BIOL 4600); (4) core microbiology courses: Microbiology (BIOL 4250 and 4250L), Microbial Physiology and Metabolism (BIOL 4257), Immunology (BIOL 4251 and 4251L), and either Microbial Genetics (BIOL 5000) or Molecular Biology (BIOL 4199); (5) 9 credit hours from the following list of electives (at least one of which must include a laboratory): Microbial Genetics Lab (BIOL 5000L), Pathogenic Bacteriology (BIOL 4256), Mycology (BIOL 5000), Virology (BIOL 4259), Parasitology (BIOL 4233), Marine Microbiology (BIOL 4253), Advanced Immunology (BIOL 5291), Microbial Genetics or Molecular Biology if not taken as part of the "core", Monoclonal Antibodies (BIOL 4252), Recombinant DNA (BIOL 4168), Plant Biotechnology (BIOL 4184), Honors Research (Microbiology) (BIOL 4700, 4701), and Undergraduate Research (Microbiology)

(BIOL 3900); and (6) CHEM 2132 with associated lab, PHYS 1101, 1102 and associated labs, and three additional hours of mathematics (including STAT 1221) or computer science (excluding CSCI 1101) for a total of nine hours.

BIOLOGY MINOR

A minor in biology requires 18 hours including BIOL 1222 and 1233 (or BIOL 1110 and 1115) and associated labs;

10 hours of biology electives; one laboratory beyond the introductory sequence; and a GPA of at least 2.0 in the minor. Students pursuing a biology minor are responsible for meeting all course prerequisites and corequisites.

HONORS PROGRAM IN BIOLOGY

The Honors Program is a research program for students majoring in biology. Contact the Biology Department for additional information.

Admission. Students are invited to participate in the program during their junior year by the Department Honors Committee. To qualify, a student must have completed 60 semester hours, including at least 15 hours at UNC Charlotte. At least 36 of the completed hours must be in science and mathematics. Students must have a 3.2 overall grade point average, as well as a 3.2 GPA in biology. An honors adviser and a supervisory committee are appointed for each student.

Courses. To graduate with honors, a student must complete BIOL 4700 (Honors Research I) and BIOL 4701 (Honors Research II) with a 3.5 average or better.

Certification Requirements. A cumulative grade point average of 3.2 or greater must be maintained. An honors thesis is required and the student must present a seminar on the project.

COOPERATIVE EDUCATION PROGRAM

Students majoring in biology may obtain practical work experience while pursuing their degrees. The Cooperative Education Program allows qualified students either to alternate semesters of academic study with semesters of work experience or to combine academic study and work during the same semester. The work experience is arranged by the University Career Center and must be approved by the Department of Biology. Placements are based on a students academic interests and on the availability of appropriate positions and are carried out under the supervision of a biology faculty member who serves as co-op adviser. Work semesters are followed by participation in the Biology Cooperative Education Seminar.

SUGGESTED SCHEDULE: B.A. or B.S. in BIOLOGY

Following is the sequence in which required courses should be taken, even if they are not taken during the year indicated:

Freshman year: BIOL 1222 + L and 1233 + L; CHEM 1251 +L and 1252 + L
Sophomore year: CHEM 2131 + L; BIOL 2111, 2111L; then BIOL 3166, 3144
Junior year: BIOL 3272 or 3273, then advanced electives of any number
Senior year: BIOL 4600 (seminar) and advanced electives of any number

See the Department of Biology for a more detailed schedule for the four-year program leading to the B.A. or B.S. including schedules for each of the options.

MINOR IN BIOTECHNOLOGY
Interdisciplinary

The Minor in Biotechnology requires a total of 24 hours in designated "core courses," with an overall GPA of 2.5 in those courses. For graduate study in Civil Engineering, graduate students are required to complete the same set of core courses, as well as additional graduate level engineering coursework. The core courses, offered through the three academic departments, are:

Course	Semester Hours
Biology:	
BIOL 4250 Microbiology (with lab)	4
BIOL 4000[1] Recombinant DNA	3
BIOL 4252 Monoclonal Antibody/Protein Analysis	3
Chemistry:	
CHEM 4165 Biochemistry (with lab)	4
CHEM 4171 Biochemical Instrumentation	4
Engineering:	
CEGR 4141 Process Engineering	3
CEGR 5141 Bioprocess Technology (with lab)	3
	24

In the Department of Chemistry, the substitution of CHEM 4111 for CHEM 4171 is permitted. Any other substitutions to the above core courses must be approved both by the originating department and the Biotechnology Advisory Committee.

Additional coursework in the student's individual academic unit may be required. Any such courses require the approval only of the originating department. Currently, the Department of Biology intends that the following courses be completed to obtain a B.S. in Biology with a minor in biotechnology:

Molecular Biology (BIOL 4199) or Microbial Genetics (BIOL 5000)
Plant Biotechnology (BIOL 4184)
Investigations (BIOL 3900)

Department of Chemistry

Chairperson: Professor Greenberg; Charles H. Stone *Professor Emeritus*: Burson; Charles H. Stone Professor: DuBois; *Professors*: Bush, Crosthwaite, Ogle; *Professors Emeritus*: Gibson, Kuppers; *Associate Professors*: Brown, Daignault, Jones, Mattingly, Risley, Walsh; *Assistant Professors*: Donovan-Merket, Poler, Rabinovich, Sisk; *Lecturers*: Carlin, Dammann, Hovick

Chemistry is a discipline fundamental to a wide variety of careers in industry, research and the allied bealth fields. A strong foundation in chemistry is necessary for careers in medicine, molecular biology, biochemistry, industrial or government research, pharmacy, high school teaching and chemical engineering. A background in chemistry may also be useful for careers in chemical sales, industrial management, business administration and environmental management.

The Chemistry Department offers two B.S. degree programs and a research-based M.S. degree, which provide the background necessary for a career in industry or for further graduate studies in chemistry and related fields. In addition, tbree B.A. degree tracks in chemistry are available for students who plan to pursue a career in the chemical industry, teaching, or professional studies in areas such as medicine, dentistry, veterinary medicine and optometry. The B.S. degree is approved by the American Chemical Society. "Suggested Schedules" for the B.S., B.A. and B.S./M.S. degree programs are available on the Chemistry Department web page.

Programs leading to careers in medical technology, pharmacy and chemical engineering are available in cooperation with other institutions.

BACHELOR OF SCIENCE

The B.S. degree is recommended for students planning to start careers as chemists with the baccalaureate degree and those preparing for graduate study in chemistry.

A major in chemistry leading to the B.S. degree consists of a minimum of 45 semester hours of chemistry, including CHEM 1251, 1251L, 1252, 1252L (or 1253L), 2131, 2132, 2131L, 2132L, (or 2136L), 3111, 3141, 3142, 3141L, 3142L, 3695, 4111, 4121, two semesters of 4695, two semesters of 4900, 4133 and either 4134 or 4135. (Credit toward the 45 hours required for the B.S. degree will not be given for both CHEM 4134 and 4135.) Related work in mathematics and physics must include MATH 1241, 1242, PHYS 2101, 2102, 2101L, and 2102L and two additional math courses: MATH 2241, 2242, 2164, 2171, 3125, or a Department-approved math course. Proficiency in a foreign language through the 2202 course level is recommended for the B.S. degree. It should be noted that some graduate programs require a proficiency in a foreign language. All students majoring in the B.S. program (even those operating under the old general degree requirements) are required to satisfy the UNC Charlotte general degree language requirements.

BACHELOR OF SCIENCE WITH OPTION IN BIOCHEMISTRY

Minimum of 44 semester hours of chemistry, including CHEM 1251, 1252, 1251L, 1252L (or 1253L), 2131, 2132, 2131L, 2132L (or 2136L), 3111, 3141, 3142, 3141L, 3142L, 3695, 4165, 4166, 4165L, 4111 or 4171, two semesters of 4695, and two semesters of 4900 (or BIOL 3900 with special permission from the Department of Chemistry) culminating in a comprehensive written report; related work in mathematics, physics, and biology must include MATH 1241, 1242, PHYS 2101, 2102, 2101L, and 2102L, and BIOL 1233, 2111, and either 4166, 4171, 4199, or 3273 and two additional math courses: MATH 2241, 2242, 2164, 2171, 3125, or a Department-approved math course. The B.S. degree will require the completion of a minimum of 122 semester hours of credit. Proficiency in a foreign language through the 2202 course level is recommended for the B.S. degree. It should be noted that some graduate programs require a proficiency in a foreign language. All students majoring in the B.S. program (even those operating under the old general degree requirements) are required to satisfy the UNC Charlotte general degree language requirements.

BACHELOR OF ARTS

A major in chemistry leading to the B.A. degree consists of a minimum of 30 semester hours of chemistry including completion of the requirements for one of the three tracks below in addition to the following core courses: CHEM 1251, 1251L, 1252, 1252L, 2131, 2131L, 2132, 2132L, and 3111. Related work must include MATH 1241, 1242, and a complete sequence of physics courses selected from one of the following options: (A) PHYS 1101, 1101L, 1102, 1102L; (B) PHYS 2221, 2221L, 2231, 2231L; or (C) PHYS 1102, 1102L, 2221, 2221L. The B.A. curriculum can be tailored to fit the needs of students preparing for professional schools, a career in chemistry, and secondary teaching licensure.

Preprofessional. Students majoring in chemistry who are planning future studies in medicine, dentistry or other allied health professions should choose CHEM 4165 and 4165L and take as electives BlOL 1233 and BlOL 2111 and recommends at least one additional biology course at the 3000 or 4000 level.

Chemistry. Students planning to pursue employment in chemical industry should choose CHEM 3113 (or 4111).

Teacher Licensure. To meet North Carolina requirements for secondary (grades 9-12) teaching licensure in Chemistry, students must complete at least 33 hours in chemistry including: CHEM 1251, 1251L, 1252, 1252L, 2131, 2131L, 2132, 2132L, 2141, 2125, 3111, 3695, 4165, 4165L, and two semesters of 4695. Students must also complete 12 hours of physics (including PHYS 1101, 1101L, 1102, 1102L, and a physics elective), 6 hours of calculus (MATH 1241 and 1242), and 4 hours of a biology or earth science course with laboratory (BIOL 1110 + 1110L or ESC1 1200 + 1200L). Students seeking teaching licensure should consult a co-adviser in the Department of Middle, Secondary, and K-12 Education in the College of Education for detailed planning of their professional education coursework. Licensure applications are the responsibility of the student and the Office of Student Academic Services in the College of Education.

BACHELOR OF ARTS WITH AN OPTION IN MEDICAL TECHNOLOGY

A student majoring in chemistry may complete the departmental requirements for the B.A. degree in three years. Upon satisfactory completion of training in medical technology at a school of medical technology which has been approved by the Accrediting Agency for Clinical Laboratory Science for the Committee on Allied Health Education and Accreditation and UNC Charlotte, the student may receive a B.A. degree in chemistry from UNC Charlotte. Gaining admission to an approved school of medical technology is the responsibility of the student. A maximum of 30 hours will be accepted from the school of medical technology. Four of these hours will apply toward the requirements for the major in chemistry. The student must have at least a 2.0 grade point average, overall and in the major, at the end of the junior year. The final 30 hours counted toward the degree and the last 12 hours counted toward the major prior to entering a school of medical technology must be taken at UNC Charlotte. The student may obtain information from the departmental adviser concerning those Schools of Medical Technology at Carolinas Medical Center or Presbyterian Hospital in Charlotte, which are affiliated with UNC Charlotte in this program. Individual applications for admission to a particular school of medical technology must be submitted.

MINOR IN CHEMISTRY

A minor in chemistry consists of 23 semester hours of chemistry including CHEM 1251, 1251L, 1252, 1252L, 2131, 2131L, 2132, 2132L, either 3111 or 4171, and three additional semester hours at the 2000 level or above. A minimum GPA of 2.0 in the minor is required. Credit toward the 23 hour total will not be given for either CHEM 4695 or 4900. Special topics courses such as CHEM 3090 and CHEM 5090 may be included with prior departmental approval.

Interdisciplinary Minor in Biotechnology. Please refer to the Biology section of this catalog for a detailed description of the interdisciplinary minor in biotechnology.

HONORS PROGRAM IN CHEMISTRY

This program is intended primarily for chemistry majors. It is a research-oriented program. Details are available from the Chemistry Department.

Admission. Consideration for admission to the program may be initiated by the student or by any faculty member. The Honors Committee of the Chemistry Department will formally approve admission. The student will formally enter the honors program at the beginning or halfway through his/her junior year.

Courses. Independent research and seminars.

Certification Requirements. To obtain a degree with Honors in Chemistry, a student must successfully complete at least three hours of independent research at the honors level, one semester of the senior seminar at the honors level, and prepare and successfully defend an honors thesis based on research.

COOPERATIVE EDUCATION EXPERIENCE

Students majoring in chemistry may obtain practical work experience in chemistry before graduation by participating in the Chemistry Cooperative Education Experience any time after the completion of sophomore year and CHEM 2132. A minimum GPA of 2.5 overall and 2.5 in chemistry is required. At least two semesters of work assignments must be completed concurrent with enrollment in CHEM 3500. Advisers will assist students to design a schedule which accommodates both work assignments and the upper division chemistry courses which are normally offered on alternate semesters. Experiences are arranged in coordination with the University Career Center.

FIVE-YEAR B.S./M.S. PROGRAM

The combined B.S./M.S. program leads to completion of 152 credit hours and all requirements for the B.S. and M.S. degrees in only five academic years and one or two summers. In this program, students complete requirements for the B.S. degree and begin graduate coursework and research in their senior, or fourth, year. Students may leave the program after four years with the B.S. degree, or they may complete an additional academic year and summer of full-time study and research to earn both the B.S. and M.S. degrees in Chemistry.

Students may be admitted to the M.S. portion of this program without entrance examinations if they have a GPA of at least 3.0 in their chemistry, mathematics and physics courses, have completed the standard B.S. curriculum through at least physical chemistry, and have taken the Graduate Record Examination. Students should consult with the Graduate Coordinator about their eligibility for this program and to discuss requirements for selection of a research adviser.

Students accepted into the B.S./M.S. program must complete all requirements for the B.S. and M.S. degrees, including at least 16 hours in 6000-level courses. At least 6 hours are required in CHEM 6115, 6125, 6135, 6146, 6060 or other approved courses, 1 hour each in CHEM 6681 and 6682, and 1 to 16 hours in CHEM 6900. A research thesis is required for the M.S. degree and it must be successfully defended before the student's thesis committee. The student and the research adviser select this committee of no fewer than four members, including one member from outside the Chemistry Department, before the beginning of the fifth year.

Department of Communication Studies

Chairperson: Professor Hill; *Professor:* Huffman; *Associate Professors:* Crane, Leeman; *Assistant Professors*: Doerfel, Taylor; *Lecturers:* Coppoletta, Hofer

The Communication Studies program offers training in the practice and theory of communication across a

variety of contexts. Among these are public communication, interpersonal communication, small group communication, organizational communication, public relations and mass communication. In addition, students examine specific types of communication such as argumentation, debate and persuasion.

BACHELOR OF ARTS

Admission Requirements. Freshmen declaring a Communication Studies major must meet all requirements for undergraduate admission to the University. Students matriculated at UNC Charlotte and planning to change to or declare Communication Studies as their major must have an overall GPA of at least 2.0, and no grade less than C in COMM 1101 or its equivalent.

Transfer students from other institutions must meet all general requirements for admission to the University. Acceptance into the Communication Studies major requires that they have no grade less than a C in COMM 1101 or its equivalent.

Matriculated and transfer students who do not meet requirements for admission to the program because of special circumstances may petition the Department of Communication Studies for acceptance into the program.

Degree Requirements. The proposed program leading to the Bachelor of Arts degree in Communication Studies is a 120 semester hour program, including 36 hours in the major, 18 hours in approved related work or a minor, and 32-53 hours in general education requirements for the baccalaureate degree.

Core Requirements (24 hours)

All students complete 24 hours of CORE requirements designed to provide a thorough understanding of fundamental communication processes. The CORE requirements are structured into four major categories:

General Theory/Skills (12 hours)

COMM 1101 Introductory Speech (3)
COMM 2100 Intro. to Communication Theory (3)
COMM 2101 Introduction to Rhetorical Theory (3)
COMM 3101 Persuasion (3)

Research Methodology (6 hours)

STAT 1222 Introduction to Statistics (3)
COMM 3100 Communication Research Methods (3)

Macro-Context (3 hours)

COMM 3120 Communication and Mass Media (3) **or**
COMM 3130 Communication and Public Advocacy (3)

Micro-Context (3 hours)

COMM 2103 Argumentation and Debate (3) **or**
COMM 2105 Small Group Communication (3) **or**
COMM 2107 Interpersonal Communication (3)

Concentration Requirements (12 hours)

Students must also complete 12 hours of course work in a specific concentration of study. Courses which are required within a particular concentration or used as electives within the concentration cannot simultaneously be used to fulfill CORE requirements. The concentrations are designed to provide students with the opportunity to pursue more extensive study in the communication context most relevant to their professional and social goals. Four concentrations of study are offered:

***Mass Media* (12 hours)**

The Mass Media concentration is designed for students interested in the development and critical analysis of the media as a cultural force. Contemporary issues in media criticism are explored. Students may also receive limited exposure to media production.

Students choosing this concentration complete the following courses:

COMM 3120 Communication and Mass Media (3)
COMM 4101 Media and the Law (3)

Students then complete the following courses:

ENGL 2106 Film Criticism (4)
POLS 3104 Mass Media and Politics (3)

or select 6 hours from:

JOUR 2160 Introduction to Journalism (3)
JOUR 3160 Newswriting (3)
JOUR 3161 News Editing (3)
COMM 3121 Mass Communication and Society (3)
COMM 4102 Federal Interpretation of the First Amendment (3)

***Organizational Communication* (12 hours)**

The Organizational Communication concentration is designed for students whose careers will benefit from an understanding of the communication processes that occur within organizational contexts. Students explore both the theory and practice of organizational communication.

All students choosing this concentration will complete the following courses:

COMM 3141 Organizational Communication (3)
COMM 4141 Advanced Organizational Communication (3)

Students select 3 hours from the following:

COMM 2105 Small Group Communication (3)
COMM 2107 Interpersonal Communication (3)

Students select 3 hours from the following:

ENGL 2116 Technical Communication (3)
MGMT 3160 Business Communication (3)
PSYC 2171 Introduction to Industrial/Organizational Psychology (3)
SOCY 4115 Sociology of Corporations (3)

Communication and Public Advocacy **(12 hours)**

The Communication and Public Advocacy concentration is designed for those students desiring a well-developed background in the use, theory, construction and analysis of public messages. The course of study provides training in individual public communication skills and provides a foundation for the analysis and evaluation of advocacy discourse.

All students choosing this concentration complete the following courses:

COMM 2102 Advanced Public Speaking (3)
COMM 2103 Argumentation and Debate (3)
COMM 3130 Communication and Public Advocacy (3)

Students select 3 hours from the following:

COMM 3131 African-American Oratory (3)
COMM 3403 Debate Practicum (2)
(May be repeated but no more than 3 hours will apply to meeting this elective requirement.)
ENGL 4165 Language and Culture (3)
EDUC 4135 Audiovisual Communication (3)
POLS 3104 Mass Media and Politics (3)

Public Relations **(12 hours)**

The Public Relations concentration is designed to provide students with a general background in public relations. Students examine both the theory and practice of public relations.

Students choosing this concentration complete the following courses:

JOUR 2160 Introduction to Journalism (3)
COMM 3145 Communication and Public Relations (3)
COMM 4145 Public Relations Lab (3)

Students select 3 hours from the following:

COMM 4101 Media and the Law (3)
EDUC 4135 Audiovisual Communication (3)
ENGL 2116 Technical Communication (3)
JOUR 3160 News Writing (3)
JOUR 3161 News Editing (3)
HUSV 3190 Public Relations for Human Service Agencies (3)

Related Course Work (18 hours)

All students must complete 18 hours of related course work excluding any courses applied to Core Requirements or to the student's chosen concentration. Related course work must be approved by the major adviser. An approved second major or a minor may be used to satisfy this requirement.

COMMUNICATION STUDIES MINOR

The minor in Communication Studies consists of 21 semester hours, which must include: two core courses, COMM 1101 (Introductory Speech) and COMM 2100 (Communication Theory); a required course within the track of study; and an additional 12 semester hours to be selected from a list of approved courses. Additional electives are possible with prior approval. COMM 3050 (Topics in Communication Studies), and COMM 3880 (Independent Study), may be included as part of the 12 hours of electives with prior approval of the Departmental Chairperson, although these courses may not be substituted for a required course. A maximum of six hours of electives may be cross-applied between tracks for students pursuing double minors. Students must attain an overall GPA of 2.0 in all coursework within the minor. In addition, students must fulfill general education requirements and requirements for their major. Students planning to declare a Communications Studies minor should consult with the Departmental Chairperson.

TRACKS WITHIN THE MINOR

Communication Theory and Process is a track of study designed for students to obtain a broad understanding of the theory of the human communication process. It is especially beneficial for students planning to pursue advanced study in the field of communication. In addition to COMM 1101 and 2100, each student must take COMM 2100, and 12 hours of electives selected from: COMM 2101, 2107, 3101, 3120, 3130, 3141, 3145, 4141, 4145; ENGL 4165; and ANTH 4120.

Mass Media is a track of study designed for students interested in the development of the media as a cultural force and contemporary issues in media criticism. In addition to COMM 1101 and 2100, each student must take COMM 3120, and 12 hours of electives selected from: COMM 3101, 3121, 4101, 4102; POLS 3104; JOUR 2160; EDUC 4135; and ARSC 3400 (limit three hours). (Prior approval by the Coordinator is required for ARSC 3400.)

Organizational Communication is a track of study designed for students anticipating careers involving communication in organizational settings. In addition to COMM 1101 and 2100, each student must take COMM 3141, and 12 hours of electives selected from: COMM 2105, 2107, 3101, 4141; SOCY 4115; ENGL 2116; MGMT 3160; and PSYC 2171.

Public Advocacy is a track of study designed for those students seeking a well-developed background in the general theory and practice of public communication. In addition to COMM 1101 and 1107, each student must take COMM 2102 and 12 hours of electives selected from: COMM 2101, 2103, 3101, 3130, 3131, 3403 (limit four hours) and EDUC 4135.

Public Relations is a track of study designed for students anticipating careers in the public relations context. The track emphasizes understanding the theory and practice of the role of public relations in society. In addition to COMM 1101 and 2100, each student must take COMM 3145, and 12 hours of electives selected from: COMM 2102, 3101, 4101, 4145; ENGL 2116, JOUR 2160, 3160, 3161; POLS 3103; EDUC 4135, and ARSC 3400 (limited three hours). (Prior approval by the Departmental Chairperson is required for ARSC 3400.)

JOURNALISM MINOR

The minor in journalism provides an introduction to journalism areas such as writing, editing, feature writing, layout and design, and related communication and media issues. It is designed for students who have completed ENGL 1101 and 1102. The minor consists of 18 hours of coursework including:

JOUR 2160 Introduction to Journalism
JOUR 3160 News Writing
JOUR 3161 News Editing

The nine (9) hours of elective coursework needed to complete the minor may be chosen from:
ENGL 4204 Expository Writing (3)
JOUR 3162 Feature Writing (3) (or other journalism topics courses offered by the Communication Studies Department.)
ARTS 2235 Photography I (3)
ARTS 3250 Visual Communication and Design I (3)
ARTS 3251 Visual Communication and Design II (3) or an equivalent layout course
COMM 3120 Communication and the Mass Media
POLS 3103 Public Opinion and the Mass Media
POLS 3104 Politics and the Mass Media

Note: Students may count JOUR 3160, 3161, and 3162 toward the major in English **or** toward the minor in Journalism; students may *not* count the same courses toward both.

With their adviser's approval, students in the Communication Studies major may count as related course work any course used to fulfill requirements for the Journalism minor as long as that course is not simultaneously being used to fulfill either *CORE* or *TRACK* requirements of the major.

Department of Criminal Justice

Chairperson: Professor Friday; *Professors*: Dean, Hirschel; *Associate Professors:* Blowers, Jamieson, Lumb; *Assistant Professors:* Bjerregaard, Coston, Elrod, Lord, Spinner

As society and the problems of crime and delinquency have become increasingly complex, so has the field of criminal justice. Courtroom activity has consequences for law enforcement; corrections reforms have consequences for the courts. The criminal justice professional needs knowledge and understanding of all three major components to perform successfully in any one of them. Toward this end the Department of Criminal Justice offers students the opportunity to acquire knowledge of the broader criminal justice system.

Undergraduate students pursuing the academic study of the criminal justice system, a career in a criminal justice field, or preparation for graduate study may select the criminal justice curriculum leading to a Bachelor of Arts degree. Transfer students must complete 31 hours of criminal justice coursework unless they have completed the equivalent of CJUS 1100 at another institution. In this case, CJUS 1100 is waived and 28 hours are required. The Department also offers a minor. Students may enroll in the B.A. program on either a full-time or part-time basis. Evening classes are scheduled to accommodate part-time students.

Transfer students who have an AAS degree in a criminal justice related discipline may be awarded a maximum of 36 semester hours of credit for criminal justice coursework completed with a grade of *C* or better. They will also receive credit for courses that fulfill UNC Charlotte general education requirements if the completed courses are part of an approved college transfer curriculum.

The department also offers a Master of Science degree program in Criminal Justice.

BACHELOR OF ARTS

A major in criminal justice requires STAT 1222 and 31 semester hours of criminal justice courses, including CJUS 1100 (Introduction to Criminal Justice), CJUS 3100 (Criminal Justice Theory), CJUS 3101 (Research Methods in Criminal Justice), and *one* course from *each* of the following areas:

Law Enforcement Area
CJUS 3000 Topics in Criminal Justice
CJUS 3141 Law Enforcement Behavioral Systems
CJUS 3143 Nature of Policing in America
CJUS 4000 Topics in Criminal Justice (Law Enforcement)

Corrections Area
CJUS 3130 Correctional Administration
CJUS 3150 Community Corrections
CJUS 3151 Institutional Corrections
CJUS 3153 Juvenile Corrections
CJUS 4000 Topics in Criminal Justice (Corrections)

Legal Area
CJUS 3000 Topics in Criminal Justice
CJUS 3102 American Criminal Courts
CJUS 3110 Criminal Justice and the Law
CJUS 3111 Criminal Procedure
CJUS 3121 Juvenile Law
CJUS 3152 Correctional Law
CJUS 4000 Topics in Criminal Justice (Legal)

A minimum of a *C* average in all criminal justice coursework and at least a *C* in CJUS 1100, 3100 and 3101 are required.

While not required, students are encouraged to participate in internship programs available through the department. Internships provide opportunities to combine theory and practice in a realistic setting, and to make more judicious career decisions. Consult the Department of Criminal Justice for a suggested schedule to complete the B.A. degree with a major in Criminal Justice.

CRIMINAL JUSTICE MINOR

A minor in Criminal Justice is available to all undergraduates except criminal justice majors and requires 18 approved semester hours including: CJUS 1100 and 3100, and 12 semester hours of upper-division criminal justice electives. A grade point average of at least 2.0 is required including at least a grade
CJUS 1100 and 3100.

Department of Dance and Theatre

Chairperson: Professor Huskey; *Associate Professors*: Croghan, Hubbard, Neil, Sofras; *Assistant Professors*: Allison, Barrett, Burton, Webster; *Senior Lecturer:* Zuckerman; *Lecturers*: Reiss, Thibodeaux

The Department of Dance and Theatre offers programs leading to the Bachelor of Arts (B.A.) Degree in dance, theatre, dance education and theatre education, minors in dance and theatre; and courses of interest to the general university student.

The curricula include courses in acting, directing, dance techniques (modern, ballet, jazz), choreography, and design (costume, scenic, lighting, sound). Courses in history, play analysis and dance criticism provide the theoretical foundation of the liberal arts degree. Specialized pedagogy classes and laboratory experiences are included in the dance and theatre education degree programs which lead to K-12 teacher licensure. All majors include a departmental core curriculum consisting of Cornerstone and Capstone Seminars, Production and Performance Practica, Exploration of Voice and Movement, and Elements of Design for the Stage. Students complete their majors by taking the specific dance, dance education, theatre or theatre education discipline core and selected elective courses. The electives can be focused in the student's area of interest--performance, design, directing, choreography, theory, administration/ management or pedagogy.

The department presents informal productions; student directed and choreographed works; fully staged plays, musical theatre works, dance concerts and original collaborative works. Auditions are open to all university students. Productions and classes are held in the Rowe Arts Center which contains two theatres, two dance studios, an acting studio, design studio, shops and specialized facilities and offices.

A major in dance, dance education, theatre or theatre education provides a liberal arts education. The skills and attributes developed in dance or theatre are essential to a professional arts career and they are applicable to all life endeavors. Motivation, concentration, self-confidence, creativity, flexibility and team work are enhanced through the study of dance and theatre.

Graduates may move directly into the profession as performers, directors/choreographers, designers or teachers. More commonly, they seek advanced training in graduate programs or apprenticeships with professional organizations.

DANCE. A major in dance leading to the B.A. degree consists of 40 semester hours including 11 hours in the departmental core (DATH 1100, 1200, 1600, 2401, 2402, 3600); 20 hours in the dance core (DANC 1201, 1202, 2201, 2216, 3101, 3102); and nine hours of electives. These courses must be completed with no more than one grade of "D" and a GPA of at least 2.5.

THEATRE. A major in theatre leading to the B.A. degree consists of 40 semester hours including 11 hours in the departmental core (DATH 1100, 1200, 1600, 2401, 2402, 3600); 21 hours in the theatre core (THEA 1201, 1203, 1205, 2101, 2216, 3101, 3102); and eight elective hours. These courses must be completed with no more than one grade of "D" and a GPA of at least 2.5.

DANCE EDUCATION: (K-12). The major in dance education leads to (K-12) teacher licensure. In addition to completing the coursework for the major in dance, dance education students take DANC 3230 as one of their dance electives and complete professional education requirements (DANC 3227, 3227L, 3257, 3257L, 3467; EDUC 2100, 3160; SPED 2100, 3290; READ 3255, TECH 4100). Students seeking dance licensure should plan to declare the dance education major at the end of the sophomore year. A later decision to seek licensure may result in a delayed graduation date. A GPA of 2.75 is required for admission to student teaching. Licensure applications are the responsibility of the student and the Office of Student Academic Services in the College of Education.

THEATRE EDUCATION: (K-12). The major in theatre education leads to (K-12) teacher licensure. In addition to completing the coursework for the major in theatre, theatre education majors take THEA 2217 and 2218 as theatre electives and complete professional education requirements (THEA 1102, 1109, 2409, 2410, 3220, 3467; EDUC 2100, 3160; SPED 2100; TECH 4100; and COMM 2105 or HUSV 3110). Students seeking theatre licensure should plan to declare the theatre education major at the end of the sophomore year. A later decision to seek licensure may result in a delayed graduation date. A GPA of 2.75 is required for admission to student teaching. Licensure applications are the responsibility of the student and the Office of Student Academic Services in the College of Education.

MINORS

DANCE. A minor in dance requires 22 semester hours including: DATH 1100, 1200, 2401, and 2401 or 2402; DANC 1101, 1201, 2226 and 6 hours of dance electives.

THEATRE. A minor in theatre requires 22 semester hours including DATH 1100, 1200, 2401 and 2401 or 2402; THEA 2101, 3101 or 3102, and 8 hours of theatre electives.

HONORS PROGRAM IN DANCE AND THEATRE

The honors program in Dance and Theatre is designed primarily for majors and is based on individual honors projects.

Department of English

Chairperson: Professor Lunsford; *Bonnie E. Cone Distinguished Professor in Teaching:* Boyd H. Davis; *Russell M. Robinson, II Chair in Shakespeare:* Kay; *Professors*: Jacoby, McGavran, Moss, Shealy, Smith, Varnas, Watson, West; *Associate Professors*: Amante, Bosley, Connolly, C. Davis, Gatlin, Govan, R. Grey, McNair, Morgan, Shealy, Thiede, Wickliff, Yancey; *Assistant Professors*: Gardner, Jackson, Leebron, Patten, Pereira; *Senior Lecturers:* Eckard, L. Grey, Rothwell;

Lecturers: Burton, Cherry, Diehl, Howell, Maram, Preslar, Settle; *Emeritus Professors*: Burne, Carver, Mason, Moose; *Emeritus Associate Professors*: Harper, Shapiro.

A major in English prepares students for careers in which good communication, a knowledge of people, an awareness of ideas, and clear thinking are important. Education, law, journalism, medicine and library science are fields traditionally associated with the English major. More and more, however, persons with proficiency in writing, language and literature find increased opportunities in such fields as government, business, banking, museum work, advertising, public relations, sales, publications, printing, radio and television.

The English Department offers a Master of Arts degree program (see the *Graduate Section* of this *Catalog*), designed to accommodate students seeking the M.A. with or without graduate licensure in teaching.

Students who do not major in English but plan to take courses in English, for pleasure or in order to build their skills with language, should consult the Department about the possibility of minoring in English, or Technical/Professional Writing.

BACHELOR OF ARTS

A major in English leading to the B.A. degree consists of 33 semester hours of coursework beyond the six hours in composition (usually 1101 and 1102) that are part of the general education requirements. Required courses include ENGL 3100 and 3200, which are prerequisites for any other 3000- or 4000-level courses; one survey course in British Literature, one in American Literature, and one in either British or American (3000-level); one course in language/linguistics (above 2000-level); and five elective courses in English, two of which may be at the 2000-level and two of which must be at the 4000-level.

The English major also requires completion of COMM 1101; competency in a foreign language through the 2201 level, certified either through placement exam or coursework; and a minor established at UNC Charlotte or an individually designed minor consisting of a minimum of 18 semester hours in coursework selected from other departments designed to supplement and strengthen the goals of the major, approved by the student's adviser and the department. Students with a second major in another department will be considered automatically to have satisfied the minor requirement, as will students who complete teacher licensure requirements.

Internships. Internships in the community and at the University are available for upper-level English majors. Consult the English Department for further information.

English Department Class Attendance Policy. Students are expected to attend all scheduled English Department classes. Specific attendance policy for each section is left to the teacher.

Awards. The Department gives awards each spring (usually to senior English majors): the Margaret Bryan Award for excellence in scholarship; the Intimate Bookshop Creative Writing Awards; the Aristidis Katopodis Award for excellence in the study of English; the Julian Mason Award for excellence in the study of Southern literature; and the Robert M. Wallace Award for excellence in the study of English. Each spring, it also awards the Goudes Scholarship and the Joan Neal Scholarship to rising senior English majors, for academic excellence and financial need.

ENGLISH MINOR

A minor in English consists of 18 hours in English at the 2000 level or above. Students must take ENGL 3100 and 3200 and at least 6 additional hours in courses at the 3000 level or above to complete the minor. A GPA of 2.0 or better in the minor is required.

TECHNICAL/PROFESSIONAL WRITING MINOR

A minor in Technical/Professional Writing consists of 21 hours including ENGL 4180 and ENGL 4410 or ARTG 3408; six hours above the 1000-level in a technical or scientific discipline in addition to general education requirements; and nine hours selected from ENGL 4008, 4181, 4182, 4183 or ARTG 3283. (Enrollment in ARTG 3408 and 3283 is restricted to art majors and must be approved by the coordinators of the minor and the graphic design area.) ENGL 1101, 1102 (1103) and 2116 are prerequisites for all other courses in the minor. Students should declare the minor prior to enrollment in ENGL 2116.

TEACHER LICENSURE IN ENGLISH

Students seeking licensure to teach English in grades 9-12 should consult with their advisers in the Department of Middle, Secondary, and K-12 Education regarding education courses that are required for licensure. Such students must fulfill all the requirements of the English major and the following additional requirements and expectations: at least 39 hours in English above the 1000 level with GPA of at least 2.75 for those courses taken at UNC Charlotte; GPA of at least 2.75 for all courses taken at UNC Charlotte; and submission of an acceptable writing portfolio to, and a successful interview with, the English Department's Teacher Education Committee. Required courses include: ENGL 3100, 3200 (and/or additional approved coursework in writing); ENGL 3132 and one additional course focusing on language or literacy above the 2000 level; ENGL 3103 or 3104; and ENGL 4254. Only 6 of the 39 hours in English may be at the 2000 level, though additional 2000 level English courses may be used to fulfill general education goals. COMM 1101, which is required of all English majors, is not part of the 39 hours of English coursework. Students who are completing requirements for teaching licensure are not required to complete an approved minor at UNC Charlotte. Students should consult early with their departmental advisers regarding these requirements and expectations. Licensure applications

are the responsibility of the student and the Office of Student Academic Services in the College of Education.

Department of Foreign Languages

Chairperson: Professor Doyle; *Associate Chairperson for Undergraduate Studies:* Associate Professor Rose; *Professors*: Miller, Reimer, Suther; *Professors Emeriti*: Bush, Gabriel, Saman; *Associate Professors*: Bissiere, Gleaves, Gonzalez, Hopper, Merrill, Noiset, Park, Sandarg, Stephenson, Vance; *Associate Professor Emeritus*: Cernyak-Spatz; *Assistant Professors*: Grote, McLeod, Russi; *Senior Lecturers*: McDermott-Castro, Domoto

The Department of Foreign Languages has designed its programs to develop language skills and to provide insights into foreign cultures through the study of language, culture and literature. The Department offers the Bachelor of Arts degree with majors in French, German and Spanish. It also offers minors in these languages, Japanese, and in Western Antiquity and Classical languages, as well as a Certificate in Translating. Courses in Chinese, Italian, and Russian are offered regularly, and courses in Arabic, Hebrew, Portuguese and other languages are offered on an irregular basis, according to demand.

Students interested in foreign language study are encouraged to explore the following options: (1) a single major in French, German or Spanish, based on the standard liberal arts model, with or without teaching licensure; (2) a double major in a foreign language and another discipline or in two languages; (3) a foreign language minor; (4) a concentration in one or more languages to complement a major in another academic area; and (5) a concentration of courses leading to a Certificate in Translating.

Foreign language students may become certified to teach French, German or Spanish. Career opportunities for students who gain proficiency in one or more languages exist in education, business, government, industry, the military, nursing and social work. Courses in Business French, German and Spanish and the four-semester concentration in Translating are especially helpful for those who want to use a foreign language in the world of business and commerce. Proficiency licensure in German is available at three levels of fluency.

Scholarships, Study Abroad, Awards. Scholarships for summer study and employment abroad are available to UNC Charlotte students of French, German and Spanish. As a rule, applicants are required to major or minor in language to be eligible, and they must have completed at least two years of study in the language they propose to use abroad. The Department encourages all students to participate in a study abroad program and has exchange programs with universities in China, Costa Rica, France, Germany, Japan, Mexico, Russia, and Spain. The Department regularly presents the following awards: the Mary Jim Whitlow Award for Service to the Department, the Pierre Macy Award for Excellence in French, the German American Award for Excellence in German, the Alemannia Award for Excellence in German, and the Karl Gabriel, Robert Reimer, and Susan Cernyak-Spatz Scholarships for Excellence in German and Service to the German Program. For detailed information contact the Department of Foreign Languages.

BACHELOR OF ARTS

General Requirements for All Majors. All students are required to fulfill general education requirements described in the *Academic Regulations and Degree Requirements* section of this *Catalog*, in addition to coursework specified below. *Note*: Introductory language courses may not be taken on a pass/no credit basis if they are being used to fulfill the university foreign language requirement. Students majoring or minoring in language may not take required courses in the department on a pass/no credit basis.

Placement. All incoming students must take a placement/proficiency exam in the target language if they have had any previous experience. No student with previous experience in a language may study a course numbered 1100 or 1201 in that same language. Foreign language majors and minors must take a placement exam for correct level of placement in the sequence of courses leading to a major or minor.

Laboratory and Practicum. A separately-scheduled laboratory or practicum is required for some courses in specific languages.

Teacher Licensure. The department, in collaboration with the Department of Middle, Secondary, and K-12 Education, offers a program to prepare students for K-12 teacher licenusre in North Carolina. The student seeking licensure to teach a foreign language must fulfill the general education requirements, the foreign language major, FORL 4200 and 4201, and all courses required for licensure by the College of Education. Students planning to specialize in foreign language education should apply through the Coordinator for Foreign Language Education during the first semester of the sophomore year to obtain appropriate advising. Licensure applications are the responsibility of the student and the Office of Student Academic Services in the College of Education.

FRENCH. The French major offers two options:

Option A. Requires FREN 2201, 2202, 2207, 3201, 3202, 3203, 3209, and four additional courses at the 4000 level. Related work is to be approved by the Department. Students seeking teacher licensure take this option.

Option B. For students with a double major, requires FREN 2201, 2202, 2207, 3201, 3202, 3203, 3209, two additional courses at the 4000 level, and all courses required for the second major.

GERMAN. A major in German leading to a B.A. degree consists of GERM 2201, 2202, 3201, 3202,

3030, 3050 (two courses under different topics), 4203 or 4204, 4010 or 4020, or an additional course on the 3000 or 4000 level. German majors must enroll concurrently for one hour of GERM 4050 for each GERM 3230 or 3050 course they take. In addition, 15 hours of related work (or a declared minor), approved by the German language staff, will be required. Candidates for teacher licensure must also take FORL 4200 and 4201 and satisfy requirements specified by the College of Education.

Students majoring in German and seeking a Certificate in Translating in German must also take TRAN 3271, 3272, 3273 and 3274, but may eliminate one GERM 3000 and one GERM 4000 course from the requirements for the major listed above.

SPANISH. A major in Spanish leading to the B.A. degree consists of SPAN 2201, 2202, 3201, 3202, 3203, 3209 or 3210, and 3212, plus 12 hours of Spanish courses on the 4000 level.

FOREIGN LANGUAGE MINORS

FRENCH. A minor in French consists of FREN 2201, 2202, 2207, 3201, 3202, 3203, and 3209. Students who wish to take Commercial French (FREN 2205) and count it toward the minor may substitute it for FREN 2207 or 3203.

GERMAN. A minor in German requires 20 hours: GERM 2201, 2202, 3201, 3202, and six additional hours at the 3000- or 4000-level. A student who waived GERM 2201 and/or 2202 must take the equivalent number of hours in 3000- or 4000-level courses.

JAPANESE. A minor in Japanese consists of six courses and at least 20 hours above the 1202 level, as follows: JAPN 2201, 2202, 3201, 3202, and 3800.

SPANISH. A minor in Spanish requires 21 hours, SPAN 2201, 2202 or 2210, 3201 or 3202, 3203 or 3212, 3209 or 3210, and six additional hours at the 3000- or 4000-level. The student who is waived from SPAN 2201 must take at least one additional course at the 3000- or 4000-level.

MINOR IN WESTERN ANTIQUITY AND CLASSICAL LANGUAGES

The minor requires 15-24 semester hours depending upon student performance on the language proficiency exam. Successful completion of the minor requires GREK 2201 or LATN 2101, or three semesters of Greek and Latin; and four courses selected from at least three of the following:

(1) Ancient Material Culture: ARTS 3111 Ancient Art, ARCH 2111 Ancient Architecture;
(2) Ancient History: HIST 1115 The Ancient World, HIST 3102 History of Rome, HIST 3101 History of Greece, ANTH 3152 Early Civilizations;
(3) Greek and Roman Literature: ENGL 4210 Greek and Roman Drama, RELS 3101 Greek Myths and Religion,
(4) Greek and Roman Thought: POLS 3171 History of Classical Political Philosophy, PHIL 3211 Ancient Philosophy, PHIL 3212 Medieval Philosophy. Other courses may be approved by the classics coordinator.

CERTIFICATE IN TRANSLATING

Successful completion of TRAN 3271, 3272, 3273 and 3274 entitles the student to a Certificate in Translating. This certificate is not equivalent to a major in a foreign language, but it represents a skill developed at the bachelor's degree level. The Certificate in Translating may be taken in conjunction with a major in any field. All courses in this sequence involve translating into English from the source language.

Department of Geography and Earth Sciences

Chairperson: Associate Professor Walcott; *Knight Distinguished Professor*: Sommer; *Professors*: Bender, Furuseth, Hartgen, Ingalls, Lord, Pyle, Schul, Stuart; *Associate Professors*: Bobyarchick, Diemer, Forsythe, Ives, Moore, Xiang; *Assistant Professors*: Allan, Campbell, Haas, Marshall, Martin; *Lecturers*: Bloomer, Garo, Smith

The Department of Geography and Earth Sciences offers an interdisciplinary program of study that has three different but related components. Earth Sciences includes the study of the hydrosphere, atmosphere and surficial materials of the earth. Geology examines the composition, history and structure of the whole earth. Geography emphasizes the locational aspects of human activities as they are distributed over the earth.

Earth Sciences. The Earth Sciences program focuses on the dynamic processes acting at the surface of the earth. Students pursuing the B.S. degree choose among three options within the curriculum. The *atmosphere-hydrology* option focuses on the interaction of the hydrosphere and atmosphere with surficial materials. It includes courses in climatology, fluvial processes, hydrology and meteorology. The *environmental geology* option investigates the origin and distribution of surficial materials and examines technical aspects of human interaction with the earth. The environmental geology option combines essential elements of a geology program with applied courses such as fluvial processes, geologic mapping, hydrogeology, remote sensing and soil science in order to prepare students for employment opportunities in the fields of environmental monitoring and consulting. The *environmental information systems* option focuses on the decision-making processes of humans as they interact with the environment through such courses as environmental dilemma, environmental geology, environmental planning, geographic information systems and remote sensing.

Geography. The Geography curriculum is oriented toward the methodologies of social science in which the importance of location is stressed. Traditional regional studies and conceptual courses that deal with land use patterns, transportation systems, industrial location, the distribution of retail activities, city planning, and urban

systems are augmented by technique-oriented courses such as map design and compilation, computer mapping, analysis of satellite images, statistical methods and geographic information systems. These courses prepare students in both the concepts and methods of contemporary spatial analysis.

Students majoring in geography find careers open to them in urban and regional planning, cartography, marketing research, transportation planning, real estate development and teaching. As in earth sciences and geology, the greatest range of opportunities is open to those who earn graduate degrees. (See The Graduate School section of this Catalog regarding the M.A. degree program).

A unique advantage of the Department's interdisciplinary curriculum is that students majoring in one component of the program may take related courses in another component. A student concentrating in geology, for example, might study computer mapping as part of their major. Conversely, a geography student interested in land use planning could take supporting course work in soil science or hydrology as part of the major.

Geology. The Geology program examines the earth as a dynamic natural system by focusing on its composition, history and structure. Students pursuing a B.S. degree take coursework in areas such as mineralogy, geochemistry, structural geology, tectonics, sedimentology, stratigraphy, petrology and optical mineralogy. The program prepares students interested in graduate studies and careers as professional geologists.

Students majoring in earth sciences and geology pursue careers in environmental consulting, environmental planning, meteorology, mining, oil and gas exploration, site analysis, terrain analysis, and teaching. There are employment opportunities in both government and private industry with the greatest range of positions available to students who earn graduate degrees.

Facilities. The Department of Geography and Earth Sciences is housed in modern, well-equipped facilities. Extensive rock, mineral and fossil holdings are available for instructional purposes. The optical mineralogy laboratory features high-quality petrographic microscopes linked with image analysis and cathodoluminescence systems. Analytical facilities also include a geochemical sample preparation laboratory, a plasma emission spectrometer and rapid sediment analyzers. The petrology lab employs a precision thin section machine and an automated photomicrography unit that is attached to a research-grade polarizing microscope. A proton magnetometer and ground penetrating radar systems are available for ground-based field surveys. Frequent field trips are facilitated by the Department's vans, extensive field instruments and camping gear.

The atmospheric-hydrology laboratory houses the Department's Meteorology Data Acquisition System (McIDAS), a geographic information systems package that provides "real time" meteorological data via links to weather satellites. Stream gauges and soil analysis instruments are on hand for use in fluvial processes and soils labs.

Students have access to a Departmental computer lab equipped with networked Apple Macintosh and IBM microcomputers, a file server, and printer. This facility is networked to other labs on campus and to the University's mainframe computers. A separate Geographic Information System (GIS) and remote sensing lab houses a Sun Microsystems 4/390 fileserver, Sun Sparc workstations, digitizers, and a large format color electrostatic plotter. Arc/Info and Erdas software packages run on the workstations and are used to support classes in GIS, remote sensing and image processing, and spatial decision support systems. The department also maintains a large collection of geographically-referenced data for use by students and staff in the lab. These data sets include satellite imagery, U.S. Census Bureau files, and U.S. Geological Survey map data as well as locally-developed data sets.

The UNC Charlotte cartography lab has earned a reputation for its high quality production cartography. It has three fully-equipped darkrooms with process cameras, contact frames, platemakers and color proof exposure units. Two finishing rooms house cartographic equipment such as high-end Apple computer workstations, laser printers and scanners, and a high resolution electronic image setter.

Cooperative Education in Geography and Earth Sciences. Students in the Geography and Earth Sciences programs may obtain practical work experience while pursuing their degrees by participating in the Cooperative Education program. The work experience is approved by the Department and is closely related to the student's field of study. Students interested in learning more about participating in this program should contact the Department of Geography and Earth Sciences.

GEOGRAPHY MAJOR: BACHELOR OF ARTS

A major leading to a B.A. degree consists of 29 hours in geography and earth sciences and will include GEOG 1101, 1105, 2100, 2101, 2110 and ESCI 1101. Except for required courses, all work offered for the major must be numbered 2100 or above. Students are encouraged to take additional coursework in related disciplines or to select a second major. Consult the Department of Geography and Earth Sciences for a Suggested Schedule to complete the B.A. degree with a major in Geography.

GEOGRAPHY MAJOR: BACHELOR OF SCIENCE

A major leading to a B.S. degree consists of 40 hours of geography and earth sciences and will include 17 hours of major requirements listed below. In addition, students must complete ENGL 2116 (Introduction to Technical Communication) as well as general education English requirements, CSCI 1100 or CSCI 1201 and its lab, and one mathematics course above MATH 1103. Options are available within the major in Economic Geography and in Community and Regional Planning and other concentrations can be developed. Students

should contact their advisers about these and other possible concentrations. Except for required courses, all work offered for the major must be in courses numbered 2100 or above. Consult the Department of Geography and Earth Sciences for a Suggested Schedule to complete the B.S. degree with a major in Geography.

Major Requirements: 17 hours

GEOG 1101	World Regional Geography	3
ESCI 1101	Earth Science-Geography	4
GEOG 1105	Location of Human Activity	3
GEOG 2100	Maps and Graphs	3
GEOG 2101	Maps and Graphs Laboratory	1
GEOG 2110	Intro Geographic Research	3

Community and Regional Planning Option Requirements: select 16 hours

GEOG 3200	Land Use Planning	3
GEOG 3210	Regional Planning	3
GEOG 3215	Environmental Planning	3
GEOG 4115	Intro GIS	4
GEOG 4205	Internal Structure of the City	3
GEOG 4210	Urban Planning Methods	3

Economic Geography Option Requirements: select 15 hours

GEOG 3150	Manufacturing Geography	3
GEOG 4155	Retail Location	3
GEOG 4160	Geography of Transportation Systems	3
GEOG 4205	Internal Structure of the City	3
GEOG 4255	Applied Population Analysis	3
GEOG 3000	Topics in Regional Geography	3
GEOG 4000	Selected Topics in Geography	3

Option-related electives to complete B.S. degree may be selected from:

GEOG 3100	The City and Its Region	3
GEOG 3115	Urban Transportation Problems	3
GEOG 3265	Behavioral Geography	3
GEOG 4110	Computer Mapping	3
GEOG 4155	Retail Geography	3
GEOG 4255	Applied Population Analysis	3
GEOG 4400	Internship in Geography	3-6
GEOG 5115	Advanced GIS	4

GEOGRAPHY MINOR

A minor in geography consists of 19 hours, including GEOG 1101 and 1105 and ESCI 1101, and nine additional hours in geography. The minor can be tailored to support a number of majors, such as business, computer science, political science and architecture.

EARTH SCIENCES MAJOR: BACHELOR OF ARTS

A major in Earth Sciences leading to the B.A. degree consists of a minimum of 30 semester hours, including ESCI 1101 and GEOL 1200, 1200L, and 1210. The remaining 18 hours are selected from earth sciences, geology and geography and must include at least nine hours in earth sciences and geology courses numbered 3000 or above. Students are encouraged to take additional coursework in related sciences and mathematics or to select a second major. Consult the Department of Geography and Earth Sciences for a Suggested Schedule to complete the B.A. degree with a major in Earth Sciences.

EARTH SCIENCES MAJOR: BACHELOR OF ARTS, SECONDARY TEACHING OPTION

Students preparing to teach high school earth science may become licensed by earning the B.A. degree including the Secondary Teaching Option. This program consists of a minimum of 37 hours in geography and earth science including ESCI 1101, 1101L; GEOL 1200, 1200L, 1210, ESCI 2101; GEOL 3115, 3190, 3190L and GEOG 2100; 11 hours selected from earth science courses of which at least four hours are in courses numbered 3000 or above. Also required for this option are CHEM 1251 & 1251L, PHYS 1101 & 1101L, MATH 1241, SPED 2100, 3290, EDUC 2100, 2140, 3141, 3150, 3151, 3142, 3251, 3441, READ 3255, and HLED 3152; PHYS 1130 & 1130L, ESCI 2105 or BIOL 4149, and one additional physical or life science elective. Licensure applications are the responsibility of the student and the Office of Student Academic Services in the College of Education.

EARTH SCIENCES MAJOR: BACHELOR OF SCIENCE

A major in Earth Sciences leading to a B.S. degree consists of a minimum of 45 hours in earth sciences including completion of the requirements for one of the three options below in addition to the following core courses: ESCI 1101, 1101L and GEOL 1200, 1200L, and 1210; CHEM 1251 and 1251L; PHYS 1101 and 1101L (or 2201 and 2201L); and either CHEM 1252 and 1252L or PHYS 1102 and 1102L (or 2202 and 2202L); and MATH 1241 and 1242 or higher (except that students in the environmental information systems option may substitute STAT 1220 for the second math course). Students pursuing the B.S. degree in Earth Sciences must work closely with an adviser in Earth Sciences to follow a program to complete degree requirements in one of the three options offered by the department. Students with advanced permission of the department may substitute electives among the three options.

Environmental Geology Option. Required courses are GEOL 3115, 3120, 3124, 3130, 3190, 3190L; 4145 and ESCI 4140. A minimum of 7 hours of electives must be selected from GEOL 3120L, 4100, 4105, 4105L; 4110, 4130, 4145L, 4115, 4120, 4165, 4400; ESCI 3210, 3250, 4155, 4160, 4333, 4400; and GEOG 4115.

Atmospheric Science--Hydrology Option. Required courses are ESCI 3240, 3250, 4140, 4150, and 4155. A minimum of 14 hours of electives must be selected from ESCI 2105, 3210, 3251, 4160, 4800, 5160, 5222; GEOL 3120, 3120L, 4105, 4105L; 4145, 4145L, 4165; and GEOG 4115. STAT 1220 is strongly advised for students in this option.

Environmental Information Systems Option. Required courses are ESCI 2101 and 4160, GEOL 3190

and 3190L, GEOG 3215 and 4115. A minimum of 15 hours must be selected from ESCI 2105, 3170, 3210, 3240, 3250, 4140, 4150, 4155, 5160, 5222; GEOL 3115, 3120, 3120L, 4105, 4105L, 4145, 4145L, 4165; and GEOG 3200, 5115.

Consult the Department of Geography and Earth Sciences for a Suggested Schedule to complete the B.S. degree with a major in Earth Sciences or see web site http://ga-mac.uncc.edu for further information.

EARTH SCIENCES MINOR

A minor in earth sciences consists of 20 hours of earth sciences courses. Students will choose either a geology option (GEOL 1200, 1200L and 1210 are required) or an environmental earth sciences option (ESCI 1101, 1101L, 3250 and 4140 are required); and take 12 additional hours in geology and earth sciences. The minor can be tailored to support a number of majors, such as engineering, biology, chemistry or physics.

GEOLOGY MAJOR: BACHELOR OF SCIENCE

A major in Geology leading to a B.S. degree consists of a minimum of 45 hours in geology and earth sciences and 18 hours of extradepartmental courses in Chemistry, Physics and Mathematics.

Required Courses		Semester Hours
ESCI 1101	Earth Science - Geography	4
ESCI 1101L	Earth Science - Geography Lab	1
GEOL 1200	Physical Geology	3
GEOL 1200L	Physical Geology Laboratory	1
GEOL 1210	Earth History	4
GEOL 3115	Mineralogy	4
GEOL 3124	Sedimentology	4
GEOL 3130	Structural Geology	4
GEOL 4130	Optical Mineralogy	4

Elective Courses. Select 17 hours from the following:

GEOL 3120	Geochemistry	4
GEOL 3120L	Geochemistry Lab	1
GEOL 3140	Paleontology	3
GEOL 3190	Environmental Geology	3
GEOL 3190L	Environmental Geology Laboratory	1
ESCI 3210	Soil Science	3
GEOL 4100	Igneous & Metamorphic Petrology	4
GEOL 4105	Geomorphology	3
GEOL 4105L	Geomorphology Laboratory	1
GEOL 4110	Stratigraphy	4
GEOL 4115	Applied Geophysics	4
GEOL 4120	Geologic Mapping & Interpretation	4
GEOL 4135	Tectronics	4
ESCI 4140	Hydrologic Processes	4
GEOL 4145	Fundamentals of Hydrogeology	3
GEOL 4145L	Hydrogeology Laboratory	1
ESCI 4160	Fundamentals of Remote Sensing	4
GEOL 4165	Aqueous Geochemistry	4
GEOL 4800	Individual Study in Geology	1

Required Extradepartmental Courses

CHEM 1251	Principles of Chemistry	3
CHEM 1251L	Principles of Chemistry Laboratory	1
PHYS 1101	Introductory Physics I	3
PHYS 1101L	Introductory Physics I Laboratory	1
MATH 1241	Differential and Integral Calculus I	3
MATH 1242	Differential and Integral Calculus II	3
and:		
CHEM 1252	Principles of Chemistry	3
CHEM 1252L	Principles of Chemistry Laboratory	1
or:		
PHYS 1102	Introductory Physics II	3
PHYS 1102L	Introductory Physics II Laboratory	1

The following courses are recommended for students planning to attend Graduate School:

GEOL 4125	Field Camp	6
GEOL 4800	Individual Study in Geology	3
BIOL 2222	Plant Biology	4
BIOL 2233	Animal Biology	4

Gerontology

INTERDISCIPLINARY STUDIES

Coordinator: Professor Shenk
Assistant Professor: Peacock

The Interdisciplinary Program in Gerontology is designed to provide students with academic and field experiences in the area of aging. An understanding of the basic processes of aging and of its social consequences is valuable not only for students who wish to pursue careers directly related to gerontology but also for students interested in traditional careers in other areas. As the number of older persons in our society continues to increase, it will be important for people in every occupation and profession to have a basic understanding of the aging process. The goal of the program is to provide students with that basic understanding.

Gerontology is both an interdisciplinary and a multidisciplinary field. Invariably, the best research, training, and service programs in gerontology have developed when professionals from a variety of traditional academic disciplines have been afforded the opportunity to work together, each contributing a unique expertise while benefiting from the expertise of others. The minor in gerontology is built around a core sequence of interdisciplinary and multidisciplinary courses that are taught by professionals from a variety of different academic disciplines. This approach is designed to bring together information from multidisciplinary sources, integrate theoretical and applied concepts in gerontology, and communicate to students the need for an integrated approach to meeting the needs of older persons.

GERONTOLOGY MINOR

The minor in gerontology is awarded only to students completing an undergraduate major at UNC Charlotte. A total of 22 hours in gerontology courses with an overall GPA of 2.5 in those courses is required. Two interdisciplinary courses (GRNT 2100 and 3600) form the core of the gerontology sequence and are required for all students completing the minor, as are courses in the Psychology of Aging (PSYC 2124/GRNT 2124), the Sociology of Aging (SOCY 4110/GRNT 4110) and Health and the Aging Process (NURS

3115/GRNT 3100). Students must also complete six hours of approved elective courses related to gerontology. Students should confer with the gerontology coordinator as they plan their schedules.

Students who have earned a bachelor's degree from UNC Charlotte may be readmitted to pursue a minor in Gerontology, just as they may be readmitted to pursue a second major. (For further information on readmission, see the admissions section of this *Catalog*.)

Students who have earned a bachelor's degree from an institution other than UNC Charlotte may not receive a minor in Gerontology from UNC Charlotte (unless they earn a second baccalaureate degree from UNC Charlotte). Such students may request a letter from the program and/or a transcript notation which acknowledges completion of courses specified for the minor but indicates that the minor can only be awarded upon completion of the degree.

The following courses have been approved as elective courses related to gerontology. (Additional elective courses will be approved as they become available.)

ANTH 3132	Aging and Culture (XW)(3)
GRNT 4250	Aging Policy and Programs (3)(3G)
HIST 2000	History of Aging (3)
PHIL 3201	The Meaning of Death (3) **or**
RELS 3201	The Meaning of Death (3)
PHIL 3228	Biomedical Ethics (3)
PSYC 3125	Older Worker and Retirement (3)
SOCY 4130	Sociology of Health and Illness (3)(3G)
SOCY 4150	Older Individual in Society (VC)(3)
SOWK 4101	Social Work with the Elderly (3)
SOCY 4134	Families and Aging (3) (3G)

Department of History

Chairperson: Professor Haber; *Professors*: Azevedo, Johnson, Josephson, Morrill, Perzel; *Charles H. Stone Professor:* Gabaccia; *Robert Lee Bailey Professor:* Goldfield; *Professor Emeritus:* Rieke; *Associate Professors:* Clark, Dupre, Gordon, Kierner, Laurent, Smail; *Assistant Professor:* Betts, Donohue, Flower; *Lecturers:* Arroyo, Lansen

History is the broadest and most integrative of all disciplines concerned with human beings and society. Today's historians use the research tools of the social sciences to understand and explain major events and changes in human experience over time. Yet history has always been considered one of the humanities, and it remains so because historians are concerned with issues of value and meaning, with the significance that historical events had for the lives of individuals and groups. Students of history gain an understanding of people, groups and society and a sensitivity both to detailed research and the "big picture." Through the study of history, students can become better prepared for life in a rapidly changing world and a rapidly evolving economy.

Professions like law and medicine have always considered history an ideal undergraduate major because it emphasizes the essential intellectual skills: critical thinking, research, writing and speaking. For these reasons history also remains a sound preparation for almost any undergraduate and a good choice for the typical student in America, who graduates with a basic education rather than a specific job training. Most history majors, like other majors in the arts and sciences, go into a wide variety of jobs in the business world--from sales or communications to research and administration. The most popular history-related field that majors enter is teaching, and the Department of History offers a secondary teacher-licensure program in cooperation with the Department of Middle, Secondary, and K-12 Education with the College of Education. Other opportunities for training in history-related fields are available as well. Members of the faculty have expertise and offer courses in historic preservation, local history, and other aspects of public history. Through the master's program history majors can pursue their interests at the graduate level. (See *The Graduate School* section of this *Catalog*).

Study Abroad. Arrangements can be made for study abroad in Asia, Africa, Europe, Latin America or Canada.

BACHELOR OF ARTS

A major in history leading to the B.A. degree consists of 30 hours of history, including HIST 1121 and 2100, and at least six hours in any of the following areas: Asian History, African History, Middle Eastern or Latin American History. No more than 9 semester hours may be taken at the 1000 level. Three semester hours must be taken at the 4000 level. The student must achieve a minimum GPA of 2.0 in all history courses.

TEACHER LICENSURE

Teacher licensure students must complete the basic requirements for the major, including at least three semester hours in American History; 21 hours of related work distributed among three of the social sciences (Anthropology, Economics, Geogrpahy, Political Science and Sociology), and specified professional education courses to qualify for secondary (grades 9-12) social studies licensure. Licensure applications are the responsibility of the student and the Office of Student Academic Services in the College of Education.

HISTORY MINOR

A minor in History consists of 18 semester hours including HIST 1121; no more than six additional hours at the 1000 level; and at least nine semester hours selected from courses above the 1000 level. The student must achieve a minimum grade point average of 2.0 in all history courses.

HONORS PROGRAM IN HISTORY

The Department of History offers an honors program as well as individual honors courses. Both history majors and non-majors are welcome to participate.

Admission. Students or faculty may initiate applications for admission to the History Honors Program. Admission into the program is not final until both the Department Honors Committee and the University Honors Council approve the student for candidacy.

Courses. An Honors course (HIST 3700) is offered in addition to the honors thesis.

Certification Requirements. To complete the History Honors Program a student must complete HIST 3700 and write an honors thesis of 'A' quality as judged by a committee of readers. Students must complete the history major with a GPA of at least 3.25 in history and an overall GPA of at least 3.0.

International Studies

INTERDISCIPLINARY STUDIES

Associate Vice Chancellor: Professor Josephson

The Office of International Programs offers a minor that allows undergraduate students throughout the University to pursue an interdisciplinary and comparative study of foreign cultures and societies while they fulfill the academic requirements for a major in one of the approved University degree programs. Students who minor in International Studies select one of five academic tracks (African Studies, Asian Studies, European Studies, International Business, or a self-designed track focused on a particular issue, theme and/or region. The program is of particular value to those with career objectives in government, business, trade, finance, law, journalism, teaching, military service, and health. It also serves those who will seek employment with international agencies such as the United Nations and with private religious and humanitarian service organizations.

A minor in International Studies requires completion of 26 semester hours with a GPA of 2.5 or better, including 6 hours selected from GEOG 1101, POLS 1150, HIST 1100, and ANTH 1101; 8 semester hours of foreign language at the 2201 and 2202 level in a language related to the area track selected; and 12 semester hours of coursework appropriate to one of the following: African Studies, Asian Studies, European Studies, International Business or a self-designed track. See the Special Programs secion of this *Catalog* for specific requirements.

Department of Mathematics

Chairperson: Professor Tiwari; *Associate Chairperson*: Associate Professor Royster; *Coordinator of Graduate Program*: Professor Avrin; *Coordinator of Undergraduate Program*: Associate Professor Anderson; *Coordinator of Mathematics Education Graduate Program:* Associate Professor Johnson; *Coordinator of Mathematics Education Undergraduate Program:* Associate Professor Prichard; *Director of the Office of Statistics and Applied Mathematics*: Senior Lecturer Schoeps; *Bonnie E. Cone Distinguished Professor in Teaching Emerita:* Leiva; *Professors:* Figotin, Houston, Klibanov, Lambert, T. R. Lucas, Molchanov, Papadopoulos, Quinn, Shafer, Sonin, Stavrakas, Vainberg, Weinstock, Wihstutz, Yushkevich, Zhu; *Professors Emeritus:* Goodrum, Nixon; *Associate Professors:* Burnap, Cai, Chen, Dai, Goggin, Johnson, Kazemi, T. G. Lucas, Oh, Prichard, Reiter, Rothe, Wichnoski, Zhang; *Assistant Professors:* Cifarelli, Li, Sáenz-Ludlow, Stewart, Sun; *Assistant Professors Emeritus:* Roth, Wright

Mathematics has important applications to numerous areas ranging from economics and other social sciences to physics and engineering. It is a challenging and interesting area to study in its own right with a broad and varied curriculum.

The Department offers majors leading to the B.S. and B.A. degrees as well as a minor in mathematics. Students considering a major in mathematics should take at least four years of high school mathematics, including at least one year beyond Algebra II. (Only well-prepared students will be permitted to enroll in MATH 1241 without first taking MATH 1103.) While excessive specialization at the undergraduate level is not encouraged, students may choose their upper-division mathematics electives to emphasize statistics, operations research or applied mathematics. Students graduating with a bachelor's degree in mathematics should find themselves well prepared for a career in business or industry, especially if they have chosen to concentrate on some of the more applied areas in the program and have selected related work in an area of application such as economics, business or computer science. Students preparing for careers in industry or business should consider participating in the Department's Cooperative Education Program. Students completing the B.S. curriculum will be well prepared for graduate work in the mathematical sciences.

At the graduate level, the Department offers programs leading to the M.A. degree in Mathematics and in Mathematics Education, the M.S. degree in Applied Mathematics and in Applied Statistics, and the Ph.D. degree in Applied Mathematics. The M.A. degree in Mathematics develops breadth and depth in the field and provides preparation for careers in industry and teaching at junior or community colleges and for further study at the doctoral level. The M.A. degree in Mathematics Education provides career advancement opportunities for teachers, preparation for junior or community college teaching, or further work at the doctoral level in Mathematics Education. The M.S. degrees in Applied Mathematics and in Applied Statistics provide advanced work in the techniques of mathematical analysis and in statistics and applied probability and their application to the problems of industry and technology. The Ph.D. degree enables the student to master a significant body of mathematical knowledge, to relate this knowledge to a coherent area of science or engineering, and to carry on fundamental research in applied mathematics. This degree provides preparation for careers in industry, commerce, or government agencies and laboratories as well as college or university teaching. (See the *Graduate Section* of this *Catalog*.)

Teacher Licensure in Mathematics. Students preparing for licensure to teach mathematics in secondary school (grades 9-12) must major in

Mathematics. They may select either the B.A. or the B.S. degree track, but their coursework must include MATH 3125, 3181, and 4109. They must also take MAED 3103, 3105, 3252, and a number of education related courses. Before the end of the sophomore year, students should obtain an application for formal admission to the teacher education program in the Department of Middle, Secondary, and K-12 Education. Detailed information is available in the Mathematics Department office. Licensure applications are the responsibility of the student and the Office of Student Academic Services in the College of Education.

BACHELOR OF ARTS

A major in mathematics for the B.A. degree consists of a minimum of 34 hours of approved mathematics, operations research or statistics courses, including MATH 1241, 1242, 2241, 2242, 2164, 2171, 3163, and 3688; 9 additional hours of approved courses numbered 3000 or above); and MATH 3689 or 3791.

A major in mathematics also requires CSCI 1201 plus laboratory and related work consisting of 18 hours of approved courses in an area outside the Mathematics Department. All students must meet the general education requirements of the University.

BACHELOR OF SCIENCE

A major in mathematics for the B.S. degree consists of a minimum of 40 semester hours of approved MATH, STAT or OPRS courses. In addition to the requirements for the B.A. degree, the major in mathematics for the B.S. degree requires the completion of six additional hours of approved mathematics, operations research or statistics courses numbered 3000 or above (exclusive of MATH 3163) as well as a minimum of 11 hours of science courses. Upper division courses must include MATH 3141, 3142, and at least one course from among STAT 3123 and MATH 4163, 4164, 4181 and 5143.

Note: Students applying for either the B.A. or B.S. degree in mathematics must have a grade point average of at least 2.0 in each of the following categories: (1) all MATH, STAT, or OPRS courses taken, and (2) all 2000 level and above MATH, STAT, or OPRS courses taken.

MATHEMATICS MINOR

A minor in mathematics requires 18 semester hours including MATH 1241, 1242, and 2164; one course chosen from MATH 2241, 2242, 2171, STAT 2122, OPRS 2111, or any three-hour MATH, STAT, or OPRS course numbered 3000 or above; two three-hour MATH, STAT, or OPRS courses numbered 3000 or above; and an average GPA of at least 2.0 in these courses.

MINOR IN ACTUARIAL MATHEMATICS

A minor in actuarial mathematics requires MATH 1241, 1242, 2241, 2164, STAT 3122, and STAT 3123; and a minimum average GPA of 2.0 in these courses.

Completion of these courses will help prepare the student for the first two actuarial examinations administered by the Society of Actuaries and the Casualty Actuarial Society. The first actuarial exam should be taken as soon as possible after completing Calculus I, II, III and Linear Algebra, and the second examination after completing Probability and Statistics II. Further examinations cover material contained in MATH 3176, OPRS 3111, 3113, and STAT 5123, 5124.

HONORS PROGRAM IN MATHEMATICS

The purpose of the Honors Program in mathematics is to stimulate the imagination and deepen the understanding of students by encouraging independent study, and to provide recognition of exceptional achievements in mathematics. Students who complete the requirements of the program graduate with honors in mathematics.

Admission. Entrance to the Mathematics Department Honors Program is granted by the Mathematics Department, based on the following minimum requirements: (1) junior or senior standing; (2) at least 20 hours in mathematics, including MATH 1241, 1242, 2241, 2171, 2164 and 3163; and (3) a grade point average of not less than 3.0 in mathematics courses and in all University courses.

Students must apply to the Mathematics Department for admission to the program, and if admitted, must select a mathematics faculty member who is willing to serve as an honors adviser. The Department recommends students admitted to the program to the University Honors Council for formal admission to honors candidacy. (In order to graduate with honors the University requires that students be admitted to honors candidacy at least two semesters before graduation.)

Courses. A Junior Honors Seminar (MATH 3790) and a Senior Honors Tutorial (MATH 3791) are offered, both of which may be repeated for credit.

Certification Requirements. The requirements for graduation with honors are: (1) completion of all requirements for a Bachelor of Science degree in mathematics with a grade point average of 3.00 or better; (2) a grade point average of 3.25 or better in all mathematics, operations research or statistics courses, and a GPA of 3.5 or better in all mathematics honors courses; (3) completion of at least six hours of Senior Honors Tutorial (MATH 3791) with a GPA of 3.5 or better, culminating in an honors thesis approved by the Mathematics Department; and (4) recommendation by the Mathematics Department to the University Honors Council that the student graduate with honors.

Either the student or the Department may withdraw the student from the Department Honors Program. If the date for dropping courses has passed when the student leaves the program, the student must complete any courses currently in progress in order to receive passing grades in the courses.

COOPERATIVE EDUCATION PROGRAM

A student may participate in the Mathematics Cooperative Education Program in either the parallel or alternate track. The parallel track combines academic study and cooperative experience during the same semester while the alternate track alternates semesters totally devoted to work with semesters totally devoted to academic study. Students in the Mathematics Cooperative Education Program must participate in a minimum of two semesters in the program. Students interested in participating in the program should contact the Coordinator of Undergraduate Programs in the Department of Mathematics, for further information.

Museum Studies

INTERDISCIPLINARY STUDIES

Coordinator: Associate Professor Bonney

The Museum Studies minor is designed to prepare students for entry-level positions in the museum profession. Students participating in the Museum Studies minor are required to major in an academic discipline such as Anthropology, Art, Biology, Business, Chemistry, Earth Science, Education, English, History or Physics, and to fulfill all requirements for that major. Students interested in the Museum Studies minor should contact the Museum Studies Coordinator in the Department of Sociology, Anthropology and Social Work for further information.

The Museum Studies minor requires at least 18 semester hours including 12 hours of core courses (MSTS 2101, 3101, 3201, 3601), and appropriate electives. A list of courses recommended as electives is available from the Museum Studies Coordinator.

Transfer students with courses in museum studies may apply those courses towards Museum Studies electives or, upon evaluation of transcripts and course contents by the Museum Studies Coordinator and Advisory Committee, toward appropriate core courses in Museum Studies.

Department of Music

Chairperson: Associate Professor Bish; *Professor*: Dillard; *Associate Professors*: Dailey, Harding, Mosley, Price; *Assistant Professors*: Bulow, Roberts

The Department of Music offers courses for majors and non-majors ranging from theory, music appreciation, private lessons (applied music), to History of Rock Music and various jazz courses. Some specialty courses are offered, such as foreign language diction for singers, literature for the guitar, composition, and music history. Students gain performing experience through a variety of large and small ensembles, either instrumental or vocal, which are offered for academic credit.

A major in music leading to the Bachelor of Music (B.M.) degree offers the student a basic education within a liberal arts context, as opposed to highly-specialized conservatory training. Some music graduates move directly into the profession as performers or teachers, but most opt for advanced training in graduate programs or apprenticeships with professional organizations. Some music majors use their undergraduate training as a foundation for other professions, such as arts management, various private businesses, or church music work.

All music courses and most performances are held in Rowe Arts Building, a facility which is shared with the Departments of Art and Dance and Theatre. The building contains a recital hall, two rehearsal rooms, a 30-station listening laboratory, a computer-assisted learning room, an electronic music (MIDI) studio, two theaters, dance studios, various visual arts studios, classrooms, practice rooms and faculty offices.

BACHELOR OF MUSIC (B.M.) IN PERFORMANCE

A major in music leading to the BM degree consists of 67 semester hours of music including six semesters of structure and style, four semesters of ear training, two semesters of music history, eight semesters of private instruction on the student's principal instrument or voice, and eight semesters of ensemble. Each student majoring in music must pass a proficiency examination at the end of the sophomore year, including piano skills, sight-singing, and sight-reading on the major instrument or voice. A junior recital (20-30 minutes) and a senior recital (at least 50 minutes) must be presented; authorization to present a recital may be granted only following a hearing by the music faculty. All students majoring in music are required to attend Recital Seminars each semester of residence.

Reviews. A committee of at least three faculty members will review the work of each student having less than a 2.5 GPA at the end of the semester during which the student completes his/her 30th credit hour. The purpose of the review is to evaluate the potential of the student in terms of his/her goals in the major field of study. Students who show no evidence of development will be encouraged to alter their goals.

The committee will again review the student's progress near the end of the semester during which he/she expects to complete the 60th credit hour. The committee will determine that the student should continue in the program that he/she should be withdrawn from BM degree candidacy, or that he/she must be reviewed again after a year. The Chairperson will inform the student in writing of the committee's recommendation.

BACHELOR OF MUSIC (B.M.) IN MUSIC EDUCATION

The Music Education track of the Bachelor of Music degree is designed to prepare the student for a career as a public or private school music teacher and results in K-12 licensure in the State of North Carolina.

The program is divided into three concentration areas: Instrumental, Vocal, and General (elementary classroom) Music. This is a four-year program requiring 124 credits. It requires 48 hours of music and no elective hours for students with an Instrumental Music Concentration, 45 hours of music and 3 hours of electives for the Voice Concentration, and 44 hours of music and 4 hours of electives for the General Music Concentration. All students will take 27 hours in education/licensure and 49 hours in general education. For specific course requirements of the Music Education track, refer to the Department of Music Student Handbook. Licensure applications are the responsibility of the student and the Office of Student Academic Services in the College of Education.

MUSIC MINOR

A minor in music requires 19 semester hours: six hours of structure and style/ear training, three hours of music appreciation, four hours of large ensemble, and six hours of applied music (private lessons).

Department of Philosophy

Chairperson: Professor Gay; *Bonnie E. Cone Distinguished Professor in Teaching:* Lincourt; *Professors*: Fishman, Shumaker; *Associate Professors:* Croy, Kaplan, Presler; *Assistant Professor*: Toenjes

Philosophy is reasoned inquiry into basic principles for understanding the nature of persons, reality, thought, knowledge, values and beauty. It seeks to establish standards of evidence, to provide rational methods of resolving conflicts, and to create techniques for evaluating fundamental ideas and arguments in all areas of human existence and knowledge. Equally concerned with human endeavor in both the arts and the sciences, philosophy continues to reside at the core of a liberal education.

Students major or minor in philosophy out of a love for the subject and a need to pursue fundamental ideas and principles. The study of philosophy does not contribute primarily to obtaining one's first job after graduation; rather, its value lies in the range of things one can understand and enjoy throughout life. Immediate career opportunities are the same as for other solid programs in liberal arts and sciences.

Many students take just one or two philosophy courses, while majoring in other programs. They find their study of basic ideas and principles enriches their general education and adds a dimension of understanding to courses in their major program. Students often find that philosophy courses give them a deeper understanding of many contemporary social issues, such as biomedical, business, professional and technological ethics. Courses in critical thinking and logic are a benefit to students in all their coursework and can be especially useful to students who plan to enter graduate school, law school, and various professional fields.

BACHELOR OF ARTS

A major in philosophy leading to a B.A. degree consists of a minimum of 30 semester hours in philosophy, at least 15 of which are earned at UNC Charlotte with the grade of C or better, and a GPA of 2.5 for all philosophy courses applied to the major. PHIL 2101, 2105, 3211, 3213 are required. Of the remaining 18 hours, at least one course must be in a traditional historical period or figure (e.g., Medieval or Contemporary) and at least one in a traditional problem area (Aesthetics, Ethics, Metaphysics, Theory of Knowledge or Feminist Philosophy). Further specification of traditional periods and problems is given in the Philosophy Department Manual available in the department. PHIL 1105 may not be applied to the major unless department approval has been given. Criteria for department approval are stated in the Manual.

Required related work consists of 15 hours of coursework that complements the focus of the student's work in philosophy. Such work is to be chosen in consultation with the department representative or adviser. The completion of a minor or second major fulfills the related work requirement. Students contemplating graduate study in philosophy are encouraged to develop reading proficiency in German and French.

PHILOSOPHY MINOR

A minor in philosophy consists of 15 hours including the following courses and types of courses: PHIL 2101; one course in Logic (PHIL 1105, 2105 or 3235); one course in the traditional historical periods (Ancient, Medieval, Modern, or Contemporary); one course in a traditional problem area (Aesthetics, Ethics, Metaphysics, Theory of Knowledge, or another course of this type with departmental approval); and one additional three-hour course at the 3000 level or above.

In addition, restrictions on double-counting courses for COGE and the major or the minor are described in the manual available in the department office.

HONORS PROGRAM IN PHILOSOPHY

Students seeking a greater academic challenge may contact the Department Chair with a request to pursue the Honors Track within the Philosophy Major. Honors work may be undertaken as early as the first semester a student is enrolled at the University. Graduation with honors will be noted on the student's transcript and the phrase "Honors in Philosophy" inscribed on the student's diploma.

To qualify for graduation with Honors in Philosophy a student must receive the recommendation of the Honors Committee in Philosophy. The Honors Committee will consider as candidates for Honors in Philosophy students who have completed the standard philosophy major and the following requirements: a) two three-hour courses chosen by the student from University Honors courses; b) a grade of "A" for 4 hours of Honors Thesis research (which count toward the 30-hour

major requirement); c) oral presentation of the Honors Thesis before the Philosophy Department Honors Committee, other faculty, and students; d) GPA of at least 3.5 in all Philosophy courses counted toward the major; e) GPA of at least 3.2 for all departmental and University Honors courses submitted towards graduation with Honors.

Department of Physics

Chairperson: Professor Almeida; *Professors*: Corwin, Farahi, Leamy, Vermillion; *Professors Emeritus:* Pollak, Werntz; *Associate Professors*: Mayes, Melton, Oberhofer, Raja, Simpson; *Assistant Professors*: Aktas, Moyer; *Adjunct Professors:* Edwards, Splinter, Svenson, Trammell

Undergraduate study in physics is designed for students who seek simply to better understand the physical universe, as well as for students who will seek employment in a technical field following graduation, continue professional study or teach science in the public schools. The Department offers programs leading to the Bachelor of Arts and the Bachelor of Science degrees. Students who graduate with a bachelor's degree in physics may pursue graduate study in physics, engineering, or computer science or study in optometry or the medical field.

Physics students have special opportunities at UNC Charlotte. The Department of Physics is large enough to afford a variety of experiences for the students, but not so large that the student loses personal access to the faculty. Each student has the opportunity to work closely with individual faculty members of his/her choice, both in formal laboratory courses and on individual research projects.

Some upper-level undergraduates have the opportunity to assist faculty members in teaching introductory physics laboratories. This gives students practical training as well as an employment opportunity usually available only to graduate students.

BACHELOR OF ARTS

A major in physics leading to the B.A. degree consists of at least 27 semester hours in physics with an average grade of C or better, including 8 hours in an introductory sequence of either PHYS 1101, 1102, 1101L, 1102L or PHYS 2101, 2102, 2101L, 2102L. The remaining 19 hours must include PHYS 2181, 3101, 3141, and 8 additional hours at the 3000-4000 level. PHYS 3000, 4000 and 4800 may be used to fulfill the 27 semester hour requirement only if approved for this purpose by the Undergraduate Studies Committee. Also required are CHEM 1251, 1251L, and ENGL 2116. MATH 1241, 1242, 2241, 2242, and 2171 are prerequisites for certain physics courses. Freshmen should complete MATH 1241 before the beginning of their second year.

BACHELOR OF ARTS: SECONDARY TEACHER LICENSURE OPTION

Students preparing to teach high school physics may become licensed by earning the B.A. Degree: Secondary Teacher Licensure Option. A major in physics with this option consists of a minimum of 120 semester hours which fulfill the general degree requirements of the University and which include at least 27 semester hours in physics with an average grade of C or better. Of these 27 hours, 8 hours consist of an introductory sequence of either PHYS 1101, 1102, 1101L, 1102L or PHYS 2101, 2102, 2101L, 2102L. The remaining 19 hours must include, PHYS 2181, 3101, 3121, 3141, 3285, and at least 2 additional hours at the 3000-4000 level. PHYS 3000, 4000 and 4800 may be used to fulfill the 27 semester-hour requirement only if approved for this purpose by the Undergraduate Studies Committee. Also required are CHEM 1251, 1251L, ENGL 2116, and other courses specified by the Department of Middle, Secondary, and K-12 Education. MATH 1241, 1242, 2242, and 2171 are prerequisites for certain physics courses. Freshmen should complete MATH 1241 before the beginning of their second year.

A schedule to complete the Secondary Teacher Licensure Option within a 4-year period has little flexibility due to the large number of required courses and the specific mathematics prerequisites for certain required physics courses. The student should obtain a SUGGESTED SCHEDULE from the Physics Department, make arrangements for an adviser in the Department of Middle, Secondary, and K-12 Education, and obtain an up-to-date listing and schedule for required education courses. Licensure applications are the responsibility of the student and the Office of Student Academic Services in the College of Education.

BACHELOR OF SCIENCE

A major in physics leading to the B.S. degree consists of at least 36 semester hours in physics with an average grade of C or better, including 8 hours in an introductory sequence of PHYS 2101, 2102, 2101L, 2102L. Under special circumstances, and with the approval of the Undergraduate Studies Committee, PHYS 1101, 1102, 1101L, 1102L may be substituted for the PHYS 2101-2102 introductory sequence. The remaining 28 hours must include 2181,3101, 3121, 3141, 3285, 4231; at least two hours selected from PHYS 3281, 4281, 4181, or 3900; and at least 6 additional hours at the 3000-4000 level. PHYS 3000, 4000, and 4800 may be used to fulfill the 36 semester-hour requirement only if approved for this purpose by the Undergraduate Studies Committee. Also required are CHEM 1251, 1251L; CSCI 1100P or 1201 and 1201L; and ENGL 2116. MATH 1241, 1242, 2241, 2242, and 2171 are prerequisites for certain physics courses. Freshmen should complete MATH 1241 before the beginning of their second year. Students who did not take physics in high school should consider taking PHYS 1101-1102 (with laboratories) before taking PHYS 2101. Students planning for graduate study in physics are strongly recommended to take more than the minimum 36 hours of physics and should include PHYS 4222, 4232, 4241, 4242 and MATH 2242.

BACHELOR OF SCIENCE: SECONDARY TEACHER LICENSURE OPTION

Students preparing to teach high school physics may become licensed by earning the B.S. Degree: Secondary Teacher Licensure Option. The student must (a) fulfill

all requirements for the B.S. Degree and (b) complete the additional courses required by the College of Education. The student should make arrangements for an adviser in the Department of Middle, Secondary, and K-12 Education, and obtain an up-to-date listing and schedule for required education courses. It is generally not possible to complete this option within four years without attending summer sessions. Licensure applications are the responsibility of the student and the Office of Student Academic Services in the College of Education.

BACHELOR OF SCIENCE: APPLIED PHYSICS OPTION

A major in physics leading to the B.S. degree with the applied physics option requires a minimum of 30 semester hours in physics, eight semester hours in chemistry, nine semester hours of computer science, and 19 semester hours of engineering, with an average grade of C of better in all required courses. The 30 hours of required courses in physics are PHYS 2101, 2102, 2101L, 2102L, 2181, 3101, 3121, 3141, 3285, 4231, and either 3281, 4281, 4181, or 3900. The required courses in computer science are CSCI 1100P or 1201 and its laboratory, CSCI 2140 and 2141. The minimum engineering requirement consists of CEGR 2101, MEGR 3171, ESGR 2141, and 2144, EEGR 2161, and 2162, and MEET 3133. Students in this track are encouraged to select one of their free electives from PHYS 4201 and 4261. MATH 1241, 1242, 2241, 2242, 2171 and ENGL 2116 are prerequisite courses for some required physics courses.

PHYSICS MINOR

A minor in physics is available to all undergraduates except physics majors and requires a minimum of 17 hours of physics with an average grade of C or better. There are two options:

Option 1: PHYS 2101, 2102, 2101L, 2102L, 3141, and at least six additional hours in physics selected from PHYS 2181, 3000, 3101, 3121, 3151, 3281, 3285, 3900, 4000, 4140, 4241, 4222, 4231, 4232, 4242, 4281, and 4800. PHYS 3000, 4000, and 4800 may be used only if approved for this purpose by the Undergraduate Studies Committee.

Option 2: PHYS 1101, 1102, 1101L, 1102L, 3101, 3141, and at least three additional hours in physics selected from PHYS 2181, 3000, 3101, 3121, 3151, 3281, 3285, 3900, 4000, 4140, 4241, 4222, 4231, 4232, 4242, 4281, and 4800. PHYS 3000, 4000, and 4800 may be used only if approved for this purpose by the Undergraduate Studies Committee.

HONORS PROGRAM IN PHYSICS

To obtain a degree with honors in physics, the student must successfully complete an honors section of PHYS 3900 and honors sections of at least two courses selected from PHYS 4222, 4232, and 4242. The student must formally enter the Honors Program no later than the beginning of the second semester of the junior year. The Honors Committee of the Physics Department must approve admission. Details concerning this program are available from the Physics Department.

COOPERATIVE EDUCATION PROGRAM

Students majoring in physics have an opportunity to combine work experience with their academic experience. The Cooperative Education Program is a plan whereby a student completes his/her lower division coursework, and, after being formally accepted as a co-op student, alternates periods of academic coursework with periods of paid employment in an area mutually agreed upon by the student, an employer and the University. This program enables the student to integrate classroom instruction with practical on-the-job experience with business, industry, government agencies, or other employers. A student electing this option should expect to graduate in five years, instead of the four years normally required. Further information regarding Cooperative Education can be found elsewhere in this *Catalog*. Information regarding the application procedure for admission into this program can be obtained from the Physics Department.

Department of Political Science

Interim Chairperson: Professor Arrington; *Professor Emeritus*: Jamgotch; *Distinguished Professors*: Brandon, Sommer; *Professors*: Brenner, R. Brown, Chernotsky, Dorin, Lyons, McCoy, Mead, Mundt; *Associate Professors*: C. Brown, Combs, Fleitas, Rassel, Rhodes, Thompson; *Assistant Professors*: M. Brown, Cowles, Moskowitz, Walker; *Adjunct Professors*: Borgsdorf, Brennan, Jones, Maddox, Miller, Saul

Political science is the study of politics: government, law, political behavior, public policy and political philosophy. The political science curriculum is designed primarily to afford broad and modern training in the study of political institutions and political behavior for students in the liberal arts and majors planning graduate work. It also affords career-oriented or preprofessional training for teaching, law, business, public relations or work in the mass media, domestic and foreign government service, the military, teaching, and a variety of active roles in politics.

On the graduate level, the Department offers the Master of Public Administration, a professional degree for persons seeking training in public administration with specialization in local government management. (For more information, see the *Graduate School* section of this *Catalog*.)

BACHELOR OF ARTS

A major in political science for the B.A. degree requires 30 semester hours of political science to include: (1) POLS 1110 (Introduction to American Politics); (2) POLS 1130 (Introduction to Comparative Politics); (3) POLS 1150 (Introduction to International Politics); (4) at least one course in the subfield of Political Philosophy; (5) POLS 3220 (Research Methods). No more than nine hours of credit from POLS 3110, 3163, 3400 or 4800 can be offered to fulfill major requirements.

Note: Students majoring in Political Science may not use political science courses to meet Goal III (Values) or Goal VI (Understanding the Individual, Society, and Culture) of the Goals of UNC Charlotte Education.

Concentration in International Studies. Students may opt to receive the Bachelor of Arts with a concentration in International Studies. Requirements include at least 18 hours (as part of the required 30 hours in Political Science) in courses listed under International Politics or Comparative Politics and Area Studies. Majors seeking this concentration are encouraged to diversify their coursework by completing the minor in International Studies. For information on the minor in International Studies, see *Special Programs*.

Concentration in Political Science for Elementary Education Majors. Students majoring in Elementary Education who choose to complete a concentration in Political Science are required to complete at least 27 credit hours to include: (1) at least one course in the subfields of American Politics or Public Administration, (2) at least one course in the subfield of Comparative Politics and Area Studies, (3) at least one course in the subfield of International Politics, and (4) at least one course in the subfield of Political Philosophy.

Concentration in Public Policy. Students may earn the Bachelor of Arts degree in Political Science with a concentration in Public Policy by satisfying the following requirements: I) Completion of POLS 3118, 3124, 3151, 3157, 3174, and 3175 as part of the required 30 hours in Political Science; and 2) Completion of ECON 1201 and 2102.

Advanced Placement Program. Students who receive an evaluation of Qualified (3) or better on the Advanced Placement examination in American Politics will receive credit for POLS 1110. Students who receive an evaluation of Qualified (3) or better on the Advanced Placement examination in Comparative Politics will receive credit for POLS 1130.

POLITICAL SCIENCE MINOR

The political science minor requires: 18 semester hours of political science to include: (1) POLS 1110 (Introduction to American Politics); (2) POLS 1130 (Introduction to Comparative Politics); (3) POLS 1150 (Introduction to International Politics); and (4) at least one course in the subfield of Political Philosophy.

HONORS PROGRAM

To graduate with honors in Political Science and have this fact affixed to the student's transcript, a student must:

a. Comply with all of the requirements for a major in Political Science;
b. Complete at least two honors courses in the University Honors Program or in individual departments with a GPA at UNC Charlotte of at least 3.25;
c. Have an overall GPA at UNC Charlotte of at least 3.25;
d. Have a GPA of at least 3.4 in all Political Science courses taken at UNC Charlotte;
e. Complete the Senior Thesis in Political Science (POLS 3990) with a grade of A and licensure of the Department Honors Committee that the thesis deserves a grade of A and is of honors quality.
f. Be admitted formally to honors candidacy by the University Honors Council at least two semesters before graduation.

To be certified as honors quality, a thesis must contain original research and demonstrate a high degree of scholarship. Students seeking the honors designation must notify the professor who is directing their thesis no later than the second week of classes that the thesis should be evaluated for honors requirements. The directing professor will notify the Honors Committee. Students would work on their thesis under the same procedures as all other students, but would then submit their thesis for evaluation by the Honors Committee. Faculty members who serve on the Honors Committee would not evaluate senior theses completed under their supervision. Instead, the Honors Committee would ask another faculty member to evaluate the thesis in question along with the other two members of the Committee. If the Committee agreed to confer Honors on the student's thesis, it would certify this to the Department Chair. If the Committee decided that the thesis did not warrant Honors, the student would still receive whatever grade the faculty member supervising the thesis had assigned.

Department of Psychology

Chairperson: Professor Foos; *Bonnie E. Cone Distinguished Professor in Teaching:* Maisto; *Professors*: Calhoun, Cann, Goolkasian, Grimsley, Selby, Simono, Terry, Toner, Windholz; *Professor Emeritus*: Diamant; Lamal; *Associate Professors*: Buch, Cook, Fernald, Gilmore, Harver, Kaplan, Lee, Long, McAnulty, Siegfried, Sohn, Stanley-Hagan Tedeschi, Van Wallendael; *Assistant Professors*: Breedin, Gaultney, Hardy, Johnson, Pollack, Terrell; *Lecturer:* Spaulding

Psychology is the study of behavior. Psychologists are interested in discovering new knowledge about human and animal behavior and in applying that knowledge. Some of the questions psychology considers are:

How do we learn and remember information?
Why do people develop behavior disorders?
What are the changes involved in moving from infancy to old age?
How do other people influence our behavior?
How is behavior regulated by the brain?
How do we perceive the physical world?

Psychology is a young and a dynamic science and profession. Most of what we know has been learned in this century. Much is left to be learned by the psychologists of the future.

The Psychology Department offers undergraduate majors and a minor in psychology, and a Master of Arts degree. The primary objective of the undergraduate programs is to provide a solid background in the fundamentals of psychology as a science. Graduates of the program should be prepared for a variety of careers or for graduate study.

Although many careers in psychology require an advanced degree, opportunities for individuals with a bachelor's degree in psychology include serving as a teacher or psychological assistant in social service agencies, mental health centers, child and adult care centers, centers for the retarded or the emotionally disturbed, and juvenile delinquent or predelinquent homes. Students whose interests are more laboratory-oriented might become laboratory technicians or research assistants. Also, psychology majors find their skills useful in various areas of business, such as management, advertising, personnel, public relations and sales.

Graduate school is a possibility after the student completes the B.A. or the B.S. degree. For a psychologist with a master's degree or doctorate, the career opportunities grow. (See *The Graduate School* section in this *Catalog* for information on the M.A. program.) In addition, many psychology graduates broaden their skills by attending graduate schools in the areas of business, counseling, criminal justice, education and law.

BACHELOR OF ARTS

A major in Psychology leading to the B.A. degree consists of 29 hours of psychology. These hours must include General Psychology (1101 and 1101L), Research Methodology (2102), History and Systems (3103), a senior seminar (3612, 3613, 3619, 3625, 3630, 3650, 3655, or 3670), an elective, and two courses from each of the following lists:

Experimental Options
Introduction to Behavior Modification (2112)
Comparative Psychology (3110)
Psychology of Learning (3111)
Physiological Psychology (3113)
Motivation (3114)
Sensation and Perception (3115)
Human Cognitive Processes (3116)
Hereditary Behavior (3117)
Social Psychology (3130)
Basic Processes in Psychological Assessment (3140)

Developmental/Clinical/Applied Options
Child or Adolescent Psychology or Adult Develpoment and Aging (2120, 2121, 2124)
Adjustment or Abnormal Psychology (2150, 3151)
Industrial/Organizational Psychology (2171)
Psychology of Personality (3135)

The additional courses necessary to fulfill the 29-hour requirement of the major should be selected to aid the student in the attainment of personal goals. However, the student cannot include more than three hours credit in PSYC 3405 and three hours credit in PSYC 3806 in the 29-hour requirement of the major, nor will the student be allowed to take more than eight hours in PSYC 3405 or PSYC 3806.

Other specific course requirements for majors are STAT 1222 (Elements of Statistics) and six hours of coursework approved for Goal VI (Understanding the Individual, Society, and Culture) exclusive of psychology courses. All majors must satisfy the University general education requirements. For more information on requirements, see *General Education Requirements* for all Baccalaureate Degrees.

Related Work. Students who major in Psychology are expected to be exposed to a depth of knowledge in at least one domain outside of Psychology through their completion of the Related Work requirement. Related Work should be considered in terms of the fulfillment of individual educational and vocational aspirations. Completion of a minor or a second major is the recommended way to satisfy this requirement. The student may also satisfy the Related Work requirement by completing at least 15 semester hours of courses from any one department outside of the Department of Psychology. Students who receive teacher licensure may use 15 semester hours of courses in the formal education sequences as Related Work. A GPA of 2.0 must be achieved for the set of courses used as Related Work. Courses used to fulfill this requirement cannot be used to satisfy other departmental or general university requirements with the exception of Writing Intensive (within Goal I) and Values (Goal III).

BACHELOR OF SCIENCE

The Bachelor of Science degree in Psychology requires 120 semester hours as follows:

Core: 14 hours
PSYC 1101 General Psychology (with lab) (4)
PSYC 2102 Research Methodology (4)
PSYC 3103 History and Systems of Psychology (3)
PSYC 36XX Senior Seminar (3)

Developmental/Assessment Psychology: 6 hours
Two of the following courses, including at least one at the 3000-level or higher:

PSYC 2109 Educational Psychology (3)
PSYC 2120 Child Psychology (3)
PSYC 2121 Adolescent Psychology (3)
PSYC 3122 Cognitive & Language Development (3)
PSYC 3123 Social & Personality Development (3)
PSYC 2124 Adult Development & Aging (3)
PSYC 3140 Psychological Assessment (3)
PSYC 4140 Tests & Measurements (3)
PSYC 5152 Exceptional Children (3)
PSYC 5153 Mental Retardation (3)

Clinical/Industrial Psychology: 6 hours
Two of the following courses, including at least one at the 3000-level or higher:

PSYC 2150 Adjustment (3)
PSYC 2171 Industrial/Organizational (3)
PSYC 3135 Personality (3)
PSYC 3150 Clinical Processes. (3)
PSYC 3151 Abnormal Psychology (3)
PSYC 3152 Child Psychopathology (3)
PSYC 3155 Community Psychology (3)
PSYC 3172 Personnel Psychology (3)
PSYC 3173 Training Programs (3)

General/Experimental Psychology: 6 hours
Two of the following courses, including at least one at the 3000-level or higher:

PSYC 2112 Behavior Modification (3)
PSYC 3110 Comparative Psychology (3)
PSYC 3111 Learning (3)
PSYC 3112 Behavior Control (3)
PSYC 3113 Physiological Psychology (3)
PSYC 3114 Motivation (3)
PSYC 3115 Sensation & Perception (3)
PSYC 3116 Cognitive Psychology (3)
PSYC 3117 Hereditary Behavior (3)
PSYC 3130 Social Psychology (3)

Psychology Elective: 3 hours

STAT 1222. Elements of Statistics I (SBS) (3)

Reasoning and Natural Science Requirements: 18-23 hours
1. Reasoning and Natural Science (21 hours)

Two courses selected from: (6 hours)
PHIL 1105 Critical Thinking
PHIL 2105 Deductive Logic
PHIL 3135 Advanced Logic
PHYS 1101 Introductory Physics
Any CSCI
Any MATH above 1105
Any OPRS
Any STAT above 1222

One of the following biology sequences (8 hours):

BIOL 1110/1110L-1115/1115L. Principles of Biology
BIOL 1273/1273L-1274/1274L. Human Anatomy and Physiology
BIOL 1222/1222L-1233/1233L. Plant Biology/Animal Biology

One CHEM course with lab (4 hours)
One additional course in either BIOL or CHEM (3 hours)

OR

2. Completion of one of the following minors:
Biology (18 hours)
Chemistry (23 hours)
Computer Science (18 hours)
Mathematics (20 hours)

General Education Requirements and Unrestricted Electives: 59-64 hours

Unrestricted Electives: 27-38 hours

PSYCHOLOGY MINOR

A minor in psychology consists of 19 semester hours of psychology to include PSYC 1101, 1101L and a minimum of one course from both the experimental options group and the developmental/clinical/applied group. A minimum of six hours of coursework at the 3000 level or above is required. No more than three semester hours of PSYC 3806 may be counted toward the minor and PSYC 3405 may not be used for the minor.

Consult the Department of Psychology for a Suggested Schedule to complete the B.A. or B.S. degree with a Major in Psychology.

Department of Religious Studies

Chairperson: Professor Meyer; *Issac Swift Professor of Judaic Studies*: Cohen; *Blumenthal Professor of Judaic Studies:* Reeves; *Associate Professors*: Gestwicki, Getz, Johnson, St. Clair, Tabor, Thomas, White; *Assistant Professor*: Maguire

Religious Studies is an inquiry into the fundamental stories, myths, symbols and practices by which we as human beings have attempted to make sense out of ourselves and the worlds in which we live. Besides offering courses in Eastern and Western, ancient and modern religious traditions, the Department offers a number of courses that explore religious meaning in a variety of creative ways, through the study of myth and symbol, art and language, film and dreams. Attention is given to a wide range of attempts to deal with the ultimate questions about the nature of the cosmos, the nature of human beings, and the origins and destiny of human life. This wide-ranging emphasis places religious studies in dialogue with all the methods and disciplines of the liberal arts. The Department of Religious Studies makes an explicit commitment to free, non-dogmatic inquiry into religion from a pluralistic and cross-cultural perspective.

Most students major or minor in religious studies to gain a broad liberal arts education. With the flexibility of the program and its relationship to other areas of the University, students can meet the specific objectives of Religious Studies while taking a wide range of courses in other departments. Some students relate religious studies to definite vocational plans, often requiring further education in professional and graduate schools.

BACHELOR OF ARTS

A student may satisfy the requirement for the religious studies major leading to the B.A. degree after completing either of the following programs:

(A) Course Program in Religious Studies. This option requires 31 semester hours in religious studies courses, including RELS 2101 (Introduction to Western Religious Thought), 2102 (Introduction to Asian Religions), 2600 (Orientation to the Major), and 3600 (Senior Seminar); five 3000-level or above courses (two in the academic study of a single religious tradition, one from a second tradition, and two in religion and modern culture); and at least two elective courses. Lists of courses appropriate to each of these categories are available in the departmental office.

(B) Interdisciplinary Program in Religious Studies. This option is intended to provide a course of study which will make maximum use of the interdisciplinary aspects inherent in religious studies. After several courses in religious studies, a student may submit, after consultation with his or her adviser, a proposal for a program of study for the junior and senior years. If the

proposal is approved by the Department, the student will satisfy the requirement for a major in religious studies by completing the approved program rather than by taking any specified number of religious studies courses. This is not an honors program, and any student may submit a proposal to the Department. A detailed description of this program may be obtained from the office of the Department of Religious Studies.

RELIGIOUS STUDIES MINOR

A minor in religious studies consists of a minimum of 15 hours, with at least two courses at the 3000 level or above. With the help of an adviser in Religious Studies, the student will select courses in at least two different areas of the discipline. Students are encouraged to take RELS 2600 and RELS 3600, though they are not required.

Department of Sociology, Anthropology, and Social Work

Chairperson: Professor Smith; *Professors*: Dudley, Ferraro, Hutchison, Mickelson, Reichs, Shenk, Webster; *Associate Professors*: Aulette, Bonney, Forrest, Lance, Levy, Pearson; *Assistant Professors*: Fogel, Fullmer, Hopcroft, Peacock, Rice, Scheid, Simkus, Starrett, Whitmeyer, Zablotsky; *Lecturer:* Stevenson

The Department of Sociology, Anthropology, and Social Work offers academic majors in Anthropology and Sociology leading to a Bachelor of Arts degree, and a major in Social Work leading to a Bachelor of Social Work degree. On the graduate level, the Department offers the M.A. degree in Sociology.

Anthropology. Anthropology is the study of humans and their cultures and is organized into four subfields: cultural anthropology, archeology, physical anthropology, and linguistics. It focuses upon human cultural heritage and upon the biological and evolutionary aspects of humans which relate to cultural development. It emphasizes the comparative study of humans and the cross-cultural analysis of their institutionalized responses to fundamental human needs.

The study of anthropology is relevant for people whose occupations and endeavors require an understanding of human nature and biology, human history and prehistory, and the variety of cultures humans have developed. It is particularly useful for teachers, medical personnel, social workers and persons seeking careers in business and communications as well as persons who plan to work in or with foreign countries. It provides competencies needed for employment in such organizations as museums, government agencies, school systems, corporations, police departments, the Park Service and the Bureau of Indian Affairs.

Sociology. Sociology is the scientific study of human social life. It focuses upon the forces which organize and structure societies and smaller groups as well as the forces which disorganize and threaten to dissolve them. As a science, sociology applies an objective and systematic method of investigation to identify the patterns and forms of social life and to understand the processes by which they are established and changed.

The study of sociology is attractive to persons seeking a liberal education and immediate employment as well as to persons preparing for further study and professional careers. As a liberal arts program, it enables students to understand the social contexts in which they find themselves and the social forces that shape personality, actions and interactions with others. As a preprofessional program it provides an excellent background for persons entering social work, law, teaching, the ministry, journalism, planning, public relations and personnel services. It also provides analytical skills related to market research and program evaluation in human services, sales, management and other business activities.

Social Work. Social Work is a profession devoted to helping people function as effectively as possible within their environment. Social workers assist people in doing this by providing assessment, counseling, referrals, mediation, and advocacy services and by working to improve social conditions. The beginning practice for a B.S.W. graduate includes providing social services, family counseling and crisis intervention. There are opportunities to work with all age groups. The B.S.W. program provides knowledge and skills used by social workers in the medical, mental health, and mental retardation fields, schools, child welfare, family, and other social service settings. It also provides an excellent foundation for graduate careers involving advanced practice, planning, administration and evaluation of social services. The B.S.W. program prepares graduates for North Carolina Social Work Certification.

ANTHROPOLOGY MAJOR: BACHELOR OF ARTS

A major in anthropology leading to the B.A. degree requires completion of 34 semester hours of anthropology, including ANTH 1101, 2141, 2151, 3101 and 3601; 18 semester hours of electives in anthropology, including at least six semester hours in cultural anthropology; and completion of ANTH 3601 with a grade of *C* or better. Also required are 18 semester hours of related work to be arranged in consultation with the student's adviser and organized around a region, an allied discipline or theme, or minor in another approved discipline. Students should consult the Department of Sociology, Anthropology, and Social Work concerning internships and field schools in anthropology.

ANTHROPOLOGY MINOR

The minor in anthropology requires the completion of 18 hours of anthropology including ANTH 1101 and 15 hours of electives with at least one course in each of three subdivisions of anthropology: cultural anthropology, physical anthropology, and archaeology. A grade point average of at least 2.0 is required in the 18 hours of anthropology.

SOCIOLOGY MAJOR: BACHELOR OF ARTS

A major in sociology leading to the B.A. degree consists of (1) a minimum of 32 semester hours of

sociology courses; including (2) a core curriculum of SOCY 1101, 3153, 4155, and 4156; (3) at least 23 hours at the 3000 level or above (but may include SOCY 2090); and (4) a minimum of 18 semester hours of related work or a minor. Although not required, majors may choose their electives from one or more of the following thematic areas of concentration: Family (SOCY 2132, 2163, 3161, 4110, 4122, 4234, 4261, 4632); Health and Education (SOCY 4110, 4130, 4230, 4235, 4261); Social Organization (SOCY 3110, 3125, 3143, 4111, 4112, 4115, 4124); Violence and Conflict Resolution (SOCY 2171, 3173, 3175, 4132, 4172, 5631).

Related work is arranged by the student in consultation with an adviser and may consist of a concentration of courses: (1) within a single discipline; (2) selected from two complementary disciplines; or (3) focused upon a specific topic. Students in the teacher licensure program may use the courses in the professional education sequence as their related work. Students should consult with the Department of Sociology, Anthropology and Social Work about internship opportunities in sociology.

Honors Course. The department offers an honors section of "Introductory Sociology," which is designed to introduce honors students to the basic ideas and methods of sociology. There are no course prerequisites for enrollment. Admission may be initiated by interested students or the department.

SOCIOLOGY MINOR

The minor in sociology requires the completion of 18 hours in sociology including Introduction to Sociology and a theory course (SOCY 3153 or 4154 or another approved course). A grade point average of at least 2.0 is required in the 18 hours of sociology.

SOCIAL WORK MAJOR: BACHELOR OF SOCIAL WORK

A major in social work leading to the B.S.W. degree consists of: (1) a minimum of 44 semester hours of social work, including a core curriculum of SOWK 1101, 2182, 2183, 3100, 3181, 3182, 3184, 3201, 3202, 3482, 3484, 3683, 3685, and one social work elective; (2) SOCY 1101, 2171, 3110, 4156; (3) POLS 1110; (4) BIOL 1110; (5) PSYC 1101 and 3151; and (6) one gerontology course selected from SOWK, SOCY, PSYC, HIST, NURS, or GRNT.

SOCIAL WORK MINOR

A minor in Social Work requires 18 hours in social work courses as follows: SOWK 1101, 2182, 2183 and three SOWK electives to be approved by the Social Work Program. The minor does not prepare students for professional social work practice.

Urban Studies

INTERDISCIPLINARY STUDIES

URBAN STUDIES MINOR

A minor in Urban Studies requires completion of 18 hours as follows: ANTH 2125 (Urban Anthropology) or SOCY 3125 (Urban Sociology); GEOG 2165 (Patterns of World Urbanization); GEOG 3100 (City and Region); GEOG 4205 (Internal Structure of the City); HIST 3281 (American Cities); and POLS 3121 (Urban Politics)

Women's Studies

INTERDISCIPLINARY STUDIES

Coordinator: Assistant Professor Kaplan; *Adjunct Professor:* Gabaccia, Miller, S. Nkomo, Shenk, Strawn; *Adjunct Associate Professor:* Aulette, Bosley, Clark, Ives, Mickelson, Stephenson, van Wallendael, Yon; *Adjunct Assistant Professor*: Bezner, Booth, Crawford, Newman, Rivera, Ryan, Tweedy; *Adjunct Program Associate:* Bailey, Brandyberry, Haigler, Houlihan, Masse, Mozenter

The Women's Studies Program seeks to provide academic leadership in addressing women's issues by providing opportunities for the exchange of information and for faculty and student development in the scholarly areas of women's studies, gender studies, and feminist studies. A background in Women's Studies is helpful for anyone whose future career will touch on women's issues, e.g., human resources professionals, marketing strategists, social and human services providers, health care providers, lawyers, policy makers, teachers, scholars, artists, and entrepreneurs. Women's Studies courses, many of which satisfy University general education requirements, are open to all students regardless of gender.

WOMEN'S STUDIES MINOR

The Women's Studies minor is open to all students regardless of gender and requires completion of at least 21 hours in approved courses offered by the Women's Studies Program and other departments and programs. A maximum of 9 hours may be earned from any one department. Required courses for the minor are WMST 1101 (Introduction to Women's Studies); WMST 3102 (Changing Realities of Women's Lives); WMST 3201 (Feminist Thought); and WMST 4601, Senior Colloquium, which may be satisfied by taking any 4000-level course offered by the Women's Studies Program. Students minoring in Women's Studies should consult the Women's Studies Program Coordinator when planning their minor or reviewing it in preparation for graduation.

Elective Courses in Women's Studies

Topic courses offered on a rotating basis within Women's Studies include, but are not limited to:

WMST 3050	Psychology of Women
WMST 3050	Women in Art
WMST 3050	Motherhood and Morals
WMST 4050	Sexuality and Gender
WMST 4050	French Writers in Translation
WMST 6050	Language and Gender

Examples of courses offered by other departments or programs that are approved for credit toward the Women's Studies minor include, but are not limited to:

AAAS	2215	Black Families in the U.S.
ANTH	2090	Native American Women
CSLG	5100	Counseling Needs of Women
DANC	1101	American Dance: A Cultural Reflection
ENGL	4002	Women and Literature
HIST	2150	History of Women in the U.S.
HIST	3168	Women and Family in Modern East Asia
SOCY	2132	Marriage and Family
SOCY	3143	Social Movements
SOCY	4163	Sex Roles
SOCY	4631	Family Violence
SPAN	3019	Hispanic Women Writers in English Translation

A complete list of courses approved for the minor in Women's Studies is available in the Women's Studies Program Office.

The Belk College of Business Administration

Dean: Professor Mazze; *Associate Dean*: Associate Professor Conboy; *Associate Dean for Graduate Studies and Research:* Professor Geurin

Mission and Objectives. The Belk College of Business Administration is located in the largest metropolitan area in the Carolinas, and a region growing in national and international prominence. The College leads the region in the design and delivery of programs in accounting, business and economics responsive to the needs and aspirations of its constituencies.

The mission of The Belk College of Business Administration is to serve the people of the Charlotte region and our state, as well as national and international communities through comprehensive educational programs, research, and public service in business and in related areas. The primary component of the mission is to educate students at the undergraduate and graduate levels. The College also contributes to the development and application of new knowledge through the research and scholarly achievements of its faculty and students. The College further serves its communities through outreach programs and activities that promote economic health, support the development of commerce and industry, and enhance the quality of life in the region.

In support of this mission, the College has the following strategic objectives:

- To provide and support undergraduate education through programs in business administration that are excellent in quality, current in curricula, and relevant to business practice.
- To provide and support graduate programs of distinction that serve the needs of the community, meet the demands of the student population, utilize the expertise of the faculty, and support the University mission.
- To support the economic and social needs of the region through interdisciplinary programs.
- To encourage and support the faculty in areas of basic research, applied research, and efforts to secure funding for research.
- To develop and maintain research programs of distinction that support the economic competitiveness of the region, state, and nation.
- To meet the needs of the community for the continued development of leadership, management, and technical skills in business and other organizations through continuing education and other outreach programs.
- To support faculty participation in institutional and professional service.
- To develop and maintain lifelong partnerships with the alumni of the College.

Programs. The Belk College of Business Administration offers the following bachelor's degree programs:

Bachelor of Science degree in Accounting. This program offers full academic preparation for the Certified Public Accountant (CPA) designation.

Bachelor of Science in Business Administration degree. Majors are offered in:

Finance
Individualized Major in Business
Industrial and Operations Management
International Business
Management
Management Information Systems
Marketing

Bachelor of Arts degree in Economics. This program offers a Business Administration emphasis and a Social Science emphasis. The Department of Economics also offers a minor in Economics.

Honors Program: The Honors Program is available to undergraduate students majoring in one of the College's degree programs. Students meeting eligibility requirements enroll in specialized coursework designed to provide enhanced challenges and learning opportunities in business administration.

Programs are designed so that transfer students from community colleges and other institutions may enter the program and complete their degree requirements in the last two years of their college work. Students planning to take their first two years in community colleges should inform their adviser or counselor of their intent to apply to UNC Charlotte so that their program may be tailored to facilitate transfer.

The College offers several master's programs, including the Master of Business Administration, the Master of Science (M.S.) degree in Economics, and the Master of Accountancy. Programs are designed to accommodate the needs of both full-time and part-time students. See the Graduate section of this catalog for information about these programs.

Accreditation. All of the degree programs offered by the Belk College of Business Administration are accredited by the American Assembly of Collegiate Schools of Business (AACSB), which is recognized by the U.S. Department of Education as the sole accrediting agency for baccalaureate and master's degree programs in business.

Satisfaction of Prerequisites and Enrollment in Upper-Division Courses. Students must meet the prerequisites stated for the courses in the College. Enrollment in the upper division (3000- and 4000-level) courses offered by the College is open to juniors and seniors only.

Experiential Learning Opportunities. Students are encouraged to participate in professional work experiences that support academic and career development. The College is working with the University Career Center to expand experiential learning offerings to enable more students to graduate with career-related experience. The largest of these programs is Cooperative Education.

Cooperative Education involves professionally related, paid work experiences in multiple semesters. It does not offer academic credit, but it is noted on the student's transcript. To participate in this program, students must have a GPA of at least 2.5, meet specific departmental requirements, and pay a participation fee. Approval for enrollment must be arranged before the student begins the work experience. Most students begin this program during their junior year; transfer students must complete one semester at UNC Charlotte before making application for the program. Students maintain full-time student status during their co-op work semesters.

For further information, and to explore other credit and non-credit experiential learning opportunities including internships, contact major department chairperson or the University Career Center.

Evening Courses and Summer Sessions. All courses required in the Bachelor of Science in Business Administration degree program and the Bachelor of Science degree program in Accounting are offered in the evening, as well as during the day. The Master of Business Administration and the Master of Accountancy degree programs are offered in the evening. A program of summer offerings is also available.

Scholarships. There are several scholarships available for students in The Belk College of Business Administration. Some of the scholarships are designated to recognize academic excellence in the junior and senior years. Further information can be obtained from the Financial Aid Office.

PRE-BUSINESS

Students seeking admission to the Departments of Finance and Business Law, Information&Operations Management, Management, and Marketing will be classified as Pre-business students within The Belk College of Business Administration until they qualify for acceptance into an upper division major. To be accepted into an upper division major, the student must have: (1) attained junior standing; (2) completed ACCT 2121 and 2122, ECON 1201 and 1202, MATH 1120, and STAT 1220 with a minimum grade of "C" in each course; (3) earned at least a "C" in INFO 2130 (Introduction to Business Computing) or have passed the College Microcomputer Proficiency Test; and (4) filed an approved "Program of Study" in the College Office of Student Records.

Pre-business students who have earned at least 60 hours are permitted to enroll in 3000-level core business courses if they have met the specific course prerequisites and have earned at least a "C" in INFO 2130 or have passed the College Microcomputer Proficiency Test. **Students must complete all progression requirements to be eligible to enroll in MGMT 3280 and the upper division business electives.**

BUSINESS HONORS PROGRAM

Coordinator: Associate Professor J. Hogue

The primary goal of the Business Honors Program is to provide enriched educational experiences to students enrolled in The Belk College of Business Administration. Students in the Business Honors Program are provided access to a range of opportunities designed to stimulate their thinking and broaden their exposure to topics directly and indirectly related to business issues. Graduation with "Honors in Business" in one of the majors offered by The Belk College requires admission to the Business Honors Program and completion of:

1. Business Honors Seminar: BUSN 3780.
2. Business Honors Thesis: BUSN 3790.
3. An additional nine credit hours of Business Honors courses.
4. Three credit hours from the University Honors Program.

Business Honors courses are special sections of required business courses designated for honors students. Class size is limited to permit active participation by all students and to permit more flexibility in methods of delivery by the instructors. University Honors courses are team taught by faculty members from different disciplines and are also limited in size. The University Honors Program offers many courses (HONR prefix) which provide an interdisciplinary perspective on "Issues for Human Survival in the 21st Century."

Admission. The Business Honors Program is open to any qualified student enrolled in The Belk College of Business Administration. Qualifications for admission will be determined by the Business Honors Program Coordinator and will be based upon the availability of space in the Business Honors Program and the individual student's demonstrated honors potential at the time of application for admission. Students seeking admission to The Business Honors Program must complete an "Application for Admission" and be interviewed by the Business Honors Program Coordinator. In evaluating a student for admission to The Business Honors Program, the Business Honors Coordinator will consider a combination of GPA, SAT, courses completed, academic and other distinctions, and other factors.

Graduation with Honors in Business. To graduate with Honors in Business, a student must achieve a minimum 3.3 GPA overall and achieve a minimum 3.3 GPA in all Honors courses for which a grade was assigned. Students in the Business Honors Program are permitted to repeat no more than one non-honors course. No honors courses may be repeated. If an honors student's GPA drops below that required for graduation for two successive semesters, the student may be dropped from The Business Honors Program. A grade of "A" is required in the Business Honors Thesis. All requirements of The Belk College of Business Administration and the various departmental majors, other than GPA and course repeats, still apply.

Department of Accounting

Chairperson: Professor Godfrey; *Professor:* Schroeder; *Professor Emeritus:* Turner; *Associate Professors:* Bhamornsiri, Cathey, Cornick, Guinn, Hinson, Jolly, Malmgren, Nunley; *Associate Professor Emeritus:* Williamson; *Assistant Professors:* Burton, Mynatt; *Lecturer:* Palmer, Whitener

The objective of the Accounting program is to educate students to commence and continue to develop in a wide range of professional accounting careers. This program provides conceptual and technical knowledge in the accounting and business areas which serves as a foundation for accounting career development.

The Accounting program is accredited by the American Assembly of Collegiate Schools of Business, which is recognized as the sole accrediting agency for baccalaureate degree programs in accounting by the U.S. Department of Education. Graduates find a wide range of professional careers in public practice, industry, financial institutions, government and non-profit organizations. Students who complete the program will meet the educational requirements of the State of North Carolina to take the Certified Public Accountant Examination.

BACHELOR OF SCIENCE

In addition to the general education requirements of the University, the following 25 courses are required for a B.S. degree in accounting:

ACCT 2121, 2122, 3121, 3136, 3138, 3139, 3140, 3141, 3146, 3147, 3148 or 3121; BLAW 3150, COMM 1101, ECON 1201, 1202; FINN 3120, INFO 2130, 3130; MATH 1100, 1120; MGMT 3140, 3280; MKTG 3110, OPER 3100, POLS 1110, STAT 1220.

Students may place out of MATH 1100 with the math placement test. MGMT 3160, Business Communications, which most accounting majors take for the 3000 level writing intensive requirement, cannot replace COMM 1101 as a required course. Students may apply only 30 hours in Accounting toward their major and must take at least half their courses outside the Belk College.

In addition to the University requirements of a GPA of at least 2.0 overall and in the 25 courses for the major listed above, a student must have a 2.0 GPA in all 3000-level required accounting courses and *C*'s or better in ACCT 2122, 3138, and 3139 to obtain a B.S. degree in accounting. Consult the Department of Accounting for a Suggested Schedule to complete the B.S. degree with a major in Accounting.

Special Requirements for Acceptance into the Accounting Major with Freshman Standing and for Continuation into Junior- and Senior-Level Accounting Courses. Applicants must have a predicted grade point average of at least 2.20 according to the University's calculation. A GPA of 2.75 or more in the following 10 courses is required for enrollment in required junior- and senior-level accounting courses in the Belk College of Business Administration: ENGL 1101 and 1102; MATH 1100, 1120 and STAT 1220; INFO 2130; ECON 1201 and 1202; and ACCT 2121 and 2122.

Special Requirements for Acceptance of Transfer Students into the Accounting Major. Applicants must present a grade point average of 2.75 or more in the following 10 courses or the portion they have completed: ENGL 1101 and 1102; MATH 1100, 1120 and STAT 1220; INFO 2130; ECON 1201 and 1202; and ACCT 2121 and 2122. Applicants who have not completed all 10 courses also must present an overall GPA of 2.5 or more. A GPA of 2.75 or more in the 10 courses is required for enrollment in required junior- and senior-level accounting courses.

Cooperative Education Program. Students in the Department of Accounting may obtain practical work experience related to their major by participating in the cooperative education program. The work experience arranged in coordination with the University Career Center must be closely related to the study of accounting and must be approved by the Co-op Adviser in the Accounting Department.

To be eligible for cooperative education, students must be juniors who have an overall GPA of at least 2.5 and have completed the progression courses required by the Belk College of Business Administration. Transfer students must complete at least 12 hours at UNC Charlotte to be eligible for cooperative education. Completion of courses related to the co-op position may be required prior to the co-op work experience. These courses will be established by the Co-op Adviser. Students must complete either two full-time alternating semesters of work or three consecutive part-time work semesters while taking a reduced academic load of no more than 9 credit hours. Students selected to work in a public accounting firm or for an internal audit position may complete program requirements by working one semester and either writing a paper or making a formal presentation before faculty and students.

Students planning to take the CPA Exam are encouraged to take the following in their senior year:

Accounting for Not-for-Profit Organizations. (ACCT 3130) 3
Business Law II (BLAW 3250) 3

NOTE: To avoid overspecialization, students should normally take no more than two elective courses in accounting.

Department of Economics

Chair: Professor Davis; *Professors:* Amato, Connaughton, Madsen, Schwarz, Zuber; *Professor Emeritus:* Neel, Wubben; *Associate Professors:* Gandar, Liner, McGregor, Russo, Tseng, Tucker; *Associate Professor Emeritus:* Rogers; *Assistant Professors:* Dole, Lin, Miller, Tori

The study of economics offers students a problem-solving discipline to foster their intellectual and career development. It provides students a balanced and broad educational background and prepares them to choose from a wide range of career alternatives.

The Economics program explores the economic decisions of individuals, businesses, governments and other institutions. It examines the nature of economic activity, why it takes place and how it affects everyone's lives. The program includes elective courses which enable students to tailor their educational program to meet personal needs and interests. The study of economics also helps students develop a way of thinking that is logical and rigorous. It provides decision-making tools that they can apply to personal as well as business decisions and use to address the many economic decisions they will face in the future.

The Economics Department offers two programs leading to the Bachelor of Arts degree. Students who plan to pursue careers in business-related fields such as banking, finance and international commerce, or who plan to enter an MBA program, are encouraged to elect the business administration emphasis program. Students planning to pursue a career in education, enter graduate school in economics, or attend law school are encouraged to pursue the program with social science emphasis.

Students transferring from outside the University or from other majors into the Department of Economics must have a 2.0 overall GPA and a 2.0 GPA in eight (8) specified courses: ENGL 1101 and 1102; MATH 1100 and 1120; STAT 1220; INFO 2130; and ECON 1201 and 1202.

All majors in economics must complete MGMT 3160 (Business Communications) prior to registering for any 4000 level economics course. Students transferring into the economics program as a senior must complete MGMT 3160 their first semester in the program.

A student majoring in Economics must indicate active progress toward the completion of the requirements for the major in Economics. Failure to do so will result in the student being dropped as an Economics major. A student must be accepted into another major or "undecided" category to continue enrollment at the University.

In computing the grade point average in the major all required courses are included. Not more than one grade of *D* will count toward the specified hours for a major in economics. No economics course can be repeated more than once to improve the grade in the course. The second and any subsequent grade(s) in a repeated course(s) will be included in all GPA calculations.

It is recommended that students who plan graduate work in economics complete MATH 1241, ECON 4112 and ECON 4117. Also, they should consider additional work in mathematics but should consult with their advisers concerning specific courses.

BACHELOR OF ARTS

Business Administration Emphasis. A major in economics, with business administration electives, leading to the B.A. degree consists of 63 hours specified as follows:

1. Mathematics: Basic Concepts of Mathematics (MATH 1100) (GOAL II: P) 3
   Calculus (MATH 1120) (GOAL II: P) 3
   Elements of Statistics (STAT 1220) 3
   Business Computing (INFO 2130) 3

II. Economics:
   Principles of Economics (ECON 1201 and 1202) (GOAL VI: C) . . . 6
   Economics of the Firm (ECON 3125) 3
   Econometrics (ECON 3112) 3
   Industrial Organization and Public Policy (ECON 4180) 3
   Microeconomic Analysis (ECON 3122) 3
   Macroeconomic Analysis (ECON 3123) 3

III. Business Administration and Accounting:
   Principles of Accounting (ACCT 2121 and 2122) 6
   Financial Management (FINN 3120) 3
   Business Communications (MGMT 3160) . . . 3

   Two of the following 6
   Marketing Management (MKTG 3110)
   Business Law I (BLAW 3150)
   Operations Management (OPER 3100)
   Management Concepts and Practices (MGMT 3140)

IV. Economics Electives: 12
   To be selected by the student from the 3000- and 4000-level offerings of the Department of Economics

Social Science Emphasis. A major in economics, with social science electives, leading to the B.A. degree consists of 66 hours specified as follows:

I. Mathematics:
   Basic Concepts of Mathematics (MATH 1100) (GOAL II: P) 3
   Calculus (MATH 1120) (GOAL II: P) 3
   Elements of Statistics (STAT 1220) 3
   Business Computing (INFO 2130) 3

II. Economics:
   Principles of Economics (ECON 1201 and 1202) (GOAL VI: C) 6
   Business Communications (MGMT 3160) . . . 3
   Microeconomic Analysis (ECON 3122) 3
   Macroeconomic Analysis (ECON 3123) 3
   Econometrics (ECON 3112) 3
   Mathematical Economics (ECON 4100) or Econometrics II (ECON 4112) 3
   History of Economic Thought (ECON 4177) (GOAL I: W) 3

III. Social Science Electives: 15
   Coursework to be selected from at least three of the following disciplines: anthropology, criminal justice, geography, history, political science, psychology, sociology, and social work.

IV. Economics Electives: 15
   To be selected by the student from the 3000- and 4000-level offerings of the Department of Economics.

Coursework satisfying general University requirements will not count toward the 15-hour Social Science requirement.

Cooperative Education Program. Economics majors may obtain practical work experience related to their major by participating in the cooperative education program. To be eligible for cooperative education, students must be juniors who have an overall GPA of at least 2.5 and have completed the 8 progression courses required by the

Department of Economics. Transfer students must complete at least 12 hours at UNC Charlotte to be eligible for cooperative education. Completion of courses related to the co-op position may be required prior to the co-op work experience. These courses will be established by the Co-op Adviser. Students must complete either two full-time alternating semesters of work or three consecutive part-time work semesters while taking a reduced academic load of no more than 9 credit hours.

ECONOMICS MINOR

A minor in economics requires: 18 semester hours of economics to include ECON 1201, 1202 and either 3125 or 3122, and at least nine additional hours at the 3000 or 4000 level. A GPA of at least 2.0 is required in the 18 hours.

In computing the grade point average in the minor all required courses are included. Not more than one grade of *D* will count toward the specified hours for a minor in economics. No economics course can be repeated more than once to improve the grade. The second and any subsequent grade(s) in a repeated course(s) will be included in all GPA calculations.

SUGGESTED SCHEDULE:
BUSINESS ADMINISTRATION EMPHASIS

Freshman Year

ENGL 1101 3
MATH 1100 3
GOAL IV 4
GOAL V: (A) 3
Elective 2

ENGL 1102 3
MATH 1120 3
GOAL IV 4
Electives 5

Sophomore Year

ECON 1201 (GOAL VI: (C)) 3
INFO 2130 3
ACCT 2121 3
GOAL III 3
GOAL VI: (X) 3

ECON 1202 3
ACCT 2122 3
STAT 1220 3
GOAL I: (W) 3
GOAL V: (L) 3

Junior Year

ECON 3112 3
ECON 3122 3
Economics Elective 3
GOAL I: (W) 3
MGMT 3160 (W) 3
Elective 3

ECON 3125 3
ECON 3123 3
Economics Elective 3
MKTG 3110, BLAW 3150, OPER 3100
or MGMT 3140 3
Elective 3

Senior Year

ECON 4180 3
FINN 3120 3
Economics Elective 3
Electives 6

Economics Elective 3
MKTG 3110, BLAW 3150,
OPER 3100, or MGMT 3140 3
Electives 9

SUGGESTED SCHEDULE:
SOCIAL SCIENCE EMPHASIS

Freshman Year

ENGL 1101 3
MATH 1100 3
GOAL IV 4
GOAL V: (A) 3
Elective 2

ENGL 1102 3
MATH 1120 3
GOAL IV 4
Elective 5

Sophomore Year

ECON 1201 (GOAL VI: (C)) 3
INFO 2130 3
Social Science Elective 3
GOAL III 3
GOAL VI: (X) 3

ECON 1202 3
Social Science Elective 3
STAT 1220 3
GOAL I: (W) 3
GOAL V: (L) 3

Junior Year

ECON 3112 3
ECON 3122 3
Social Science Elective 3
MGMT 3160 (W) 3
Elective 3

ECON 3123 3
ECON 4100 or ECON 4112 3
Economics Elective 3
Social Science Elective 3
Electives 6

Senior Year

Social Science Elective 3
Economics Electives 6
Electives 6

ECON 4177 3
Economics Electives 6
Electives 6

Department of Finance and Business Law

Chairperson: Professor Nunnally; *James J. Harris Chair in Insurance and Professor:* Lilly; *Torrence E. Hemby Distinguished Professor of Banking*: Sealey; *Professor:*

Trosch; *R.S. Dickson Professor Emeritus;* Walls; *Associate Professors:* Kennedy, Lamb, Plath; *Assistant Professors:* Ahmed, Blose, Francis; *Lecturers:* Baber, Miller

The Department of Finance and Business Law prepares students for financial leadership within organizations and provides them with an understanding of the legal environment in which these organizations operate. Through the program students will acquire background which will enable them to understand:

a. the concepts, process and institutions involved in planning for, acquiring and allocating capital with respect to modern business organizations;
b. the economic and legal environment of organizations, and the social and political influences on business;
c. the concepts and methods of economics, accounting, mathematics, management, information systems and business law.

BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION

A program of study in the Department of Finance and Business Law leads to a Bachelor of Science in Business Administration degree with a major in Finance. The B.S.B.A. degree requires a minimum of 120 semester hours, including 42 hours of core courses within the Belk College of Business Administration, 15 hours in the finance major, nine hours of mathematics and statistics, and completion of the University general education requirements. In addition to the nine hours of math and statistics, at least 42 hours of coursework must be taken outside of the Belk College of Business Administration. Consult the Department of Finance and Business Law for a Suggested Schedule to complete the B.S.B.A. degree with a major in Finance.

Progression Requirements. To be accepted into a major and to progress into the upper division of the College, students must have: (1) attained junior standing; (2) completed ACCT 2121 and 2122; ECON 1201 and 1202; MATH 1120; and STAT 1220 with a "C" or better in each course; (3) earned at least a "C" in INFO 2130 (Introduction to Business Computing) or have passed the College Microcomputer Proficiency Test; and (4) filed an approved "Program of Study" in the College Office of Student Records.

Pre-business students who have earned at least 60 hours are permitted to enroll in core business courses if they have met the course prerequisites and have earned at least a "C" in INFO 2130 or have passed the College Microcomputer Proficiency Test. **Students must complete all progression requirements to be eligible to enroll in MGMT 3280 and the upper division business electives.**

Core, Mathematics and Statistics Requirements. Courses which fulfill the College core and mathematics and statistics requirements are: ACCT 2121, 2122; BLAW 3150; ECON 1201, 1202 and 3125; FINN 3120; INFO 2130 and 3130; MGMT 3140, 3160 and 3280; MKTG 3110; OPER 3100; MATH 1100 and 1120; and STAT 1220. A student must have a GPA of at least 2.0 for all academic work.

FINANCE MAJOR

In addition to completing the College core and mathematics and statistics requirements (51 hours), students majoring in Finance must complete 15 hours of coursework in one of two concentrations: Financial Institutions/Commercial Banking or Financial Management. A student must have a GPA of at least 2.0 in the above 66 hours with no more than one *D* left standing. No course may be repeated more than twice. Concentration Requirements are:

Financial Institutions/Commercial Banking

FINN	3220	Financial Analysis **or**
FINN	3224	Applied Business Finance
FINN	3221	Financial Institutions and Markets
FINN	3225	Commercial Bank Management
BLAW	3250	Business Law II

One additional course from the following:

FINN	3222	Investments
FINN	3223	International Financial Management
FINN	3226	Financial Theory and Practice
ECON	3112	Econometrics
ECON	3115	Money and Banking
ACCT	3138	Intermediate Financial Accounting I
OPER	3204	Management of Service Operations

Financial Management

FINN	3220	Financial Analysis **and/or**
FINN	3224	Applied Business Finance
FINN	3222	Investments
FINN	3223	International Financial Management
FINN	3226	Financial Theory and Practice

One additional course from the following if needed for 15 hour requirement:

FINN	3221	Financial Institutions and Markets
FINN	3225	Commercial Bank Management
BLAW	3250	Business Law II
ACCT	3138	Intermediate Financial Accounting I
ECON	3112	Econometrics

Cooperative Education Program. Finance majors may obtain practical work experience related to their major by participating in the cooperative education program. To be eligible for cooperative education, students must be juniors who have an overall GPA of at least 2.5 and have completed the progression courses required by the Belk College of Business Administration. Transfer students must complete at least 12 hours at UNC Charlotte to be eligible for cooperative education. Completion of courses related to the co-op position may be required prior to the co-op work experience. These courses will be established by the Co-op Adviser. Students must complete either two full-time alternating semesters of work or three consecutive part-time work semesters while taking a reduced academic load of no more than 9 credit hours.

INDIVIDUALIZED MAJOR IN BUSINESS

Coordinator: Associate Dean Conboy

The goal of the Individualized Major in Business is to permit the student to select a combination of business

courses which will best fit his or her educational objectives. This major is available to the student who chooses not to specialize.

BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION

Students selecting the Individualized Major in Business receive a Bachelor of Science in Business Administration degree. The B.S.B.A. degree requires a minimum of 120 semester hours, including 42 hours of core courses within The Belk College of Business, nine hours of mathematics and statistics, 15 hours in the Individualized Major in Business, and completion of the University general education requirements. In addition to the nine hours of mathematics and statistics, at least 42 hours of coursework must be taken outside The Belk College of Business Administration. A student must have a GPA of at least 2.0 for all academic work. Consult the Department of Business Administration for a Suggested Schedule to complete the B.S.B.A. degree with a major in Individualized Business.

Courses which fulfill the College core and mathematics and statistics requirements are: ACCT 2121, 2122; BLAW 3150; ECON 1201, 1202 and 3125; FINN 3120; INFO 2130 and 3130; MGMT 3140, 3160 and 3280; MKTG 3110; OPER 3100; MATH 1100 and 1120; and STAT 1220.

Major Requirements. Students applying for the Individualized Major in Business must submit to the Dean's Office a written rationale supporting the request for admission to the major. In addition to completing the College core and mathematics and statistics requirements (54 hours), students selecting the Individualized Major in Business must complete 15 hours pre-approved from the 3200-level courses offered by the Departments of Accounting, Economics, Finance and Business Law, Management, Information&Operations Management, and Marketing. In order to ensure that the student receives a broad educational base, a student may take no more than six hours in any one department. A student must have a GPA of at least 2.0 in the above 69 hours with no more than one *D* left standing. No course may be repeated more than twice.

Progression Requirements. To be accepted into a major and to progress into the upper division of the College, students must have: (1) attained junior standing; (2) completed ACCT 2121 and 2122; ECON 1201 and 1202; MATH 1120; and STAT 1220 with a "C" or better in each course; (3) earned at least a "C" in INFO 2130 (Introduction to Business Computing) or have passed the College Microcomputer Proficiency Test; and (4) filed an approved "Program of Study" in the College Office of Student Records.

Pre-business students who have earned at least 60 hours are permitted to enroll in core business courses if they have met the course prerequisites and have earned at least a "C" in INFO 2130 or have passed the College Microcomputer Proficiency Test. **Students must complete all progression requirements to be eligible to enroll in MGMT 3280 and the upper division business electives.**

INTERNATIONAL BUSINESS MAJOR

Coordinator: Vacant

The primary objective of the international business major is to provide an understanding of the importance of an international perspective on the part of business managers. The major provides an integrated framework for the study of the economic and competitive environments in which international business firms operate and the impact of those environments upon managerial tasks and decisions.

BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION

Students majoring in International Business receive a Bachelor of Science in Business Administration degree with a major in International Business. The B.S.B.A. degree requires a minimum of 120 semester hours, including 42 hours of core courses within The Belk College of Business Administration, nine hours of mathematics and statistics, and completion of the University general education requirements. In addition to the nine hours of mathematics and statistics, at least 42 hours of coursework must be taken outside The Belk College of Business Administration.

Courses which fulfill the College core and mathematics requirements are: ACCT 2121, 2122; BLAW 3150; ECON 1201, 1202, and 3125; FINN 3120; INFO 2130 and 3130; MGMT 3140, 3160, and 3280; MKTG 3110; OPER 3100; MATH 1100 and 1120; and STAT 1220.

Progression Requirements. To be accepted into a major and to progress into the upper division of the College, students must have: (1) attained junior standing; (2) completed ACCT 2121 and 2122; ECON 1201 and 1202; MATH 1120; and STAT 1220 with a "C" or better in each course; (3) earned at least a "C" in INFO 2130 (Introduction to Business Computing) or have passed the College Microcomputer Proficiency Test; and (4) filed an approved "Program of Study" in the College Office of Student Records.

Pre-business students who have earned at least 60 hours are permitted to enroll in core business courses if they have met the course prerequisites and have earned at least a "C" in INFO 2130 or have passed the College Microcomputer Proficiency Test. **Students must complete all progression requirements to be eligible to enroll in MGMT 3280 and the upper division business electives.**

Major Requirements. In addition to completing the College core and mathematics and statistics requirements (51 hours), students majoring in International Business must complete 15 hours of coursework in the area of International Business. Students must complete MGMT 3274 (International Business Processes and Problems), FINN 3223 (International Financial Management), MKTG 3215 (International Marketing Management), plus any two of the following courses: ACCT 3150 (International Accounting), BLAW 3253 (International Business Transactions), ECON 3171 (International Economics for Non-majors), MKTG 3218 (Export Marketing and Logistics), POLS 3151 (International Political Economy), AAAS 3265 (African Economic Development), SOCY

2090 (Topics: Comparing Modern Societies), ANTH 4120 (Intercultural Communications), POLS 3167 (The U.S. and Japan), GEOG 3105 (Geography of the Global Economy) and POLS 3050 (The New European Union). A student must have a GPA of at least 2.0 in the above 66 hours with no more than one *D* left standing. No course may be repeated more than twice.

Students majoring in International Business are required to have or attain competency in a second language. This requirement normally will be fulfilled by completion of at least four semesters of coursework in a foreign language (two semesters in addition to the year of foreign language required in the general education program).

Department of Management

Chairperson: Professor Nkomo; *Professors:* Curran, Geurin, Hornaday, Kohut; *Associate Professors*: Beggs, Bell, Booth, Calvasina, Conboy, Jernigan, Kerr; *Assistant Professors*: Carpano, Gowan, Ensley, Pearce; *Lecturers*: Baxter, Doran

A program of study in the Department of Management leads to a Bachelor of Science in Business Administration degree with a major in Management. The Management major is designed to teach students to plan, organize, direct, and control business activities in both the public and private sectors. Students develop skills in decision making, leadership, motivation, and problem solving.

Within the Management major, students must select one of three options: Management, Human Resource Management or Small Business. The option in Management prepares students for management careers in business, industry and government. Coursework prepares students for entry-level positions in areas such as distribution, manufacturing, retail, service and transportation. The option in Human Resource Management prepares students to become Human Resource Management professionals. Coursework prepares students for entry-level positions in staffing, recruiting, training and development, compensation administration, and labor relations. The option in Small Business prepares students to work in small or medium-sized businesses or become small business owners. Coursework prepares students to develop an overall concept for a business and identify the problems that must be considered and resolved if the venture is to be successful. (Note: The option in Management is available both in the day and evening. The options in Human Resource Management and Small Business are available only during the day.)

BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION

A major in Management leading to the B.S.B.A. degree requires a minimum of 120 semester hours, including 42 hours of progression and core courses within the Belk College of Business Administration, 15 hours in the Management major, nine hours of mathematics and statistics, and completion of the University general education requirements. In addition to the nine hours of mathematics and statistics, at least 42 hours of coursework must be taken outside the Belk College of Business Administration. Students electing the Management major must meet the following requirements:

Progression Requirements. To be accepted into a major and to progress into the upper division of the College, students must have: (1) attained junior standing; (2) completed ACCT 2121 and 2122; ECON 1201 and 1202; MATH 1120; and STAT 1220 with a "C" or better in each course; (3) earned at least a "C" in INFO 2130 (Introduction to Business Computing) or have passed the College Microcomputer Proficiency Test; and (4) filed an approved "Program of Study" in the College Office of Student Records.

Pre-business students who have earned at least 60 hours are permitted to enroll in core business courses if they have met the course prerequisites and have earned at least a "C" in INFO 2130 or have passed the College Microcomputer Proficiency Test. **Students must complete all progression requirements to be eligible to enroll in MGMT 3280 and the upper division business electives.**

Core Requirements. Courses which fulfill the College core and mathematics requirements for the major are ACCT 2121, 2122; BLAW 3150; ECON 1201, 1202, and 3125; FINN 3120; INFO 2130, 3130; MGMT 3140, 3160, and 3280; MKTG 3110 and OPER 3100; MATH 1100 and 1120; and STAT 1220..

Major Requirements. In addition to progression and core requirements, students majoring in Management must complete an additional 15 hours in Management from one of the following three options:

Management Option (Available during both the day and evening)

MGMT 3240	Leadership and Organizational Behavior

(Select four of the following courses)

MGMT 3241	Human Resource Management
MGMT 3243	Employment Law
MGMT 3260	Managerial Communication
MGMT 3273	Small Business Management
MGMT 3274	International Business Processes and Problems
MGMT 3275	International Management
MGMT 3282	Business and Society

Human Resource Management Option
(Available only during the day)

MGMT 3240	Leadership and Organizational Behavior
MGMT 3241	Human Resource Management
MGMT 3244	Advanced Human Resource Management

(Select two of the following courses)

MGMT 3242	Compensation Administration
MGMT 3243	Employment Law
ECON 3105	Industrial Relations

Note: Students electing this concentration are encouraged to select as part of their 33 hours of coursework outside the Belk College of Business Administration such courses offered by the Department of Psychology as PSYC 2171 (Introduction to Industrial Organizational Psychology); PSYC 3140 (Basic Processes in Psychological Assessment); PSYC 3172 (Psychology of Personnel: Employee Selection and Classification); PSYC 3173

(Psychological Bases of Training Programs); and PSYC 3670 (Seminar in Industrial Psychology).

Small Business Option (Available only during the day)

MGMT 3240 Leadership and Organizational Behavior
MGMT 3273 Small Business Management
MGMT 3283 Practicum in Small Business Planning
(Two senior-level business electives approved by the student's adviser)

Note: Participation in this concentration requires consent of the student's adviser and the Chair of the Department of Management.

Grade Point Average (GPA) Requirements. A student must have a GPA of at least 2.0 for all academic work and for the core and major requirements with no more than one *D* left standing. No course may be repeated more than twice.

Cooperative Education Program. Management majors may obtain practical work experience related to their major by participating in the cooperative education program. To be eligible for cooperative education, students must be juniors who have an overall GPA of at least 2.5 and have completed the progression courses required by the Belk College of Business Administration. Transfer students must complete at least 12 hours at UNC Charlotte to be eligible for cooperative education. Completion of courses related to the co-op position may be required prior to the co-op work experience. These courses will be established by the Co-op Adviser. Students must complete either two full-time alternating semesters of work or three consecutive part-time work semesters while taking a reduced academic load of no more than 9 credit hours. Experiences are arranged in coordination with the University Career Center.

SUGGESTED SCHEDULE: MANAGEMENT, HUMAN RESOURCE MANAGEMENT, SMALL BUSINESS OPTIONS

Freshman Year

ENGL 1101	3
MATH 1100	3
GOAL IV	4
GOAL III	3
GOAL V: (A)	3
ENGL 1102	3
MATH 1120	3
GOAL IV	4
GOAL V: (L)	3
Elective	3

Sophomore Year

ACCT 2121	3
ECON 1201 (GOAL VI: (C))	3
STAT 1220	3
GOAL I: (W) (Outside Major)	3
Elective	3
ACCT 2122	3
ECON 1202 (GOAL VI: (C))	3
GOAL VI: (X)	3
INFO 2130	3
GOAL IV	4

Junior Year

MGMT 3140	3
BLAW 3150	3
MGMT 3160 (GOAL I: W)	3
OPER 3100	3
Elective	3
FINN 3120	3
INFO 3130	3
MKTG 3110	3
MGMT 3240	3
Elective	3

Senior Year

ECON 3125	3
Management Option	6
Electives	6
MGMT 3280	3
Management Option	6
Elective	3

Information&Operations Management Department

Chairperson: Professor Baker; *Professors*: Barnes, Conrad, Cooper, Saydam; *Associate Professors*: Hogue, Khouja, Repede, Robbins, Stylianou; *Assistant Professors*: Aytug, Crook, Kumar; *Lecturer*: J. Geurin, Hendry

The Information&Operations Management Department offers majors in two dynamic disciplines - Management Information Systems (MIS) and Industrial and Operations Management (IOM). The focus of these majors is development of information technology and operations managers who can enhance the productivity of the firm in a knowledge-driven economy. Both majors offer students an integrated background in the functional areas of business and focus on enhancing problem solving and critical thinking skills using current technology.

A major in MIS involves the application of computer technology and analytical skills to the solution of organizational problems and opportunities for innovation. MIS graduates are prepared for positions in the design, planning, development, implementation, and control of information systems and systems support.

A major in IOM focuses on the efficient use of resources to provide quality goods and services. IOM enables students to pursue such careers as production planning, project analysis, quality assurance, and scheduling. Environments in which IOM graduates are in high demand include health care, government, manufacturing, and service industries.

BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION

Students majoring in Management Information Systems receive a Bachelor of Science in Business Administration degree with a major in Management Information Systems. The B.S.B.A. degree requires a minimum of 120 semester hours, including 42 hours of core courses within The Belk College of Business Administration, 21 hours in the major (beyond the core), nine hours of mathematics and

statistics, and completion of the University general education requirements. In addition to the nine hours of mathematics and statistics, at least 42 hours of coursework must be taken outside The Belk College of Business Administration.

Students majoring in Industrial and Operations Management receive a Bachelor of Science in Business Administration degree with a major in Industrial and Operations Management. The B.S.B.A. degree requires a minimum of 120 semester hours, including 42 hours of core courses within the Belk College of Business Administration, 15 hours in the major (beyond the core), nine hours of mathematics and statistics, and completion of the University general education requirements. In addition to the nine hours of mathematics and statistics, at least 42 hours of coursework must be taken outside The Belk College of Business Administration.

Courses which fulfill the College core and mathematics and statistics requirements are: ACCT 2121, 2122; BLAW 3150; ECON 1202, 2102, and 3125; FINN 3120; INFO 2130 and 3130; MGMT 3140, 3160, and 3280; MKTG 3110; OPER 3100; MATH 1100 and 1120; and STAT 1220. Students must have a GPA of at least 2.0 for all academic work and for the major with no more than one *D* left standing in the major. Courses for computation of the GPA in the major include core and mathematics courses. No course may be repeated more than twice.

Progression Requirements. To be accepted into a major and to progress into the upper division of the College, students must have: (1) attained junior standing; (2) completed ACCT 2121 and 2122; ECON 1202 and 2102; MATH 1120; and STAT 1220 with a "C" or better in each course; (3) earned at least a "C" in INFO 2130 (Introduction to Business Computing) or have passed the College Microcomputer Proficiency Test; and (4) filed an approved "Program of Study" in the College Office of Student Records.

Pre-business students who have earned at least 60 hours are permitted to enroll in core business courses if they have met the course prerequisites and have earned at least a "C" in INFO 2130 or have passed the College Microcomputer Proficiency Test. **Students must complete all progression requirements to be eligible to enroll in MGMT 3280 and the upper division business electives.**

Cooperative Education Program. Management Information Systems and Industrial/Operations Management majors may obtain practical work experience related to their major by participating in the cooperative education program. To be eligible for cooperative education, students must be juniors who have an overall GPA of at least 2.5 and have completed the progression courses required by The Belk College of Business Administration. Transfer students must complete at least 12 hours at UNC Charlotte to be eligible for cooperative education. Completion of courses related to the co-op position may be required prior to the co-op work experience. These courses will be established by the Co-op Adviser. Students must complete either two full-time alternating semesters of work or three consecutive part-time work semesters while taking a reduced academic load of no more than 9 credit hours.

MANAGEMENT INFORMATION SYSTEMS MAJOR

The primary objective of the Management Information Systems (MIS) major is to prepare students for careers in the information systems function of organizations. The curriculum is designed to provide both technological and managerial knowledge relevant to the development and use of computer-based information systems.

The following courses are required:

CSCI 1201	Introduction to Computing I
CSCI 1201L	Computer Lab I
CSCI 1202	Introduction to Computing II
CSCI 1202L	Computer Lab II
INFO 3233	Business Database Systems
INFO 3234	Business Information Systems Development
INFO 3235	Advanced Business Information System Development
INFO 3239	Business Data Communications

Two of the following courses are required:

INFO 3000	Special Topics in MIS
INFO 3231	Business Application Development
INFO 3236	Decision Support Systems
INFO 3238	Current Issues in the Management of Information Systems
INFO 3800	Directed Study in MIS
OPER 3203	Management Science
OPER 3204	Management of Service and Project Operations
OPER 3206	Managing for Quality
CSCI 2112	Advanced Structured COBOL
CSCI 3112	Design and Implementation of Object-oriented Systems
CSCI 3141	Computer Organization
CSCI 3155	Software Engineering
CSCI 3160	Data Base Design and Implementation
CSCI 3166	Distributed Computer Info. Systems
ACCT 3140	Accounting Information Systems

Students majoring in Management Information Systems are strongly encouraged to participate in the University cooperative education program which provides substantial educational and employment opportunities. Furthermore, many companies hire only students who have participated in the cooperative education program.

INDUSTRIAL AND OPERATIONS MANAGEMENT MAJOR

The primary objective of the Industrial and Operations Management (IOM) major is to provide an understanding of technical and systematic approaches to designing production/operations systems and solving business problems. Emphasis is on the tools of the field. The following courses are required:

OPER 3201	Advanced Operations Management
OPER 3203	Management Science
OPER 3204	Management of Service and Project Operations
OPER 3206	Managing for Quality

One of the following courses is required:

OPER 3000	Topics in Operations Management
INFO 3231	Business Application Development

INFO	3233	Business Database Systems
INFO	3234	Business Information Systems Development
INFO	3236	Business Decision Support Systems
INFO	3239	Business Data Communications
MKTG	3217	Transportation and Logistics Marketing
INET	3133	Quality Control
ENGR	3670	Total Quality Systems

SUGGESTED SCHEDULE: MANAGEMENT INFORMATION SYSTEMS MAJOR

Freshman Year

ENGL 1101[1] 3
MATH 1100 3
GOAL IV 4
GOAL III 3
GOAL V: (A) 3

ENGL 1102[1] 3
MATH 1120[1,3] 3
GOAL IV 4
GOAL V: (L) 3
Elective 3

Sophomore Year

ACCT 2121[1] 3
ECON 1201[1] 3
STAT 1220[1] 3
GOAL I: (W) (Outside Major) 3
GOAL VI: (C) 3

ACCT 2122[1] 3
ECON 1202[1] 3
GOAL VI: (X) 3
INFO 2130[1] 3
GOAL IV 4

Junior Year

INFO 3130 3
MGMT 3140 3
OPER 3100 3
CSCI 1201 3
CSCI 1201L (PASCAL) 3

INFO 3233 3
INFO 3239 3
CSCI 1202 3
CSCI 1202L 3
FINN 3120 3
MKTG 3110 4
MGMT 3160 (GOAL I: (W)) 3

Senior Year

BLAW 3150 3
INFO 3234 3
ECON 3125 3
Elective 3
MIS Elective 3

MIS Elective 3
MGMT 3280[2] 3
INFO 3235 3
Elective 3

SUGGESTED SCHEDULE: INDUSTRIAL AND OPERATIONS MANAGEMENT MAJOR

Freshman Year

ENGL 1101[1] 3
MATH 1100 3
GOAL IV 4
GOAL III 3
GOAL V: (A) 3

ENGL 1102[1] 3
MATH 1120[1,3] 3
GOAL IV 4
GOAL V: (L) 3
Elective 3

Sophomore Year

ACCT 2121[1] 3
ECON 1201[1] 3
STAT 1220[1] 3
GOAL I: (W) (Outside Major) 3
GOAL VI: (C) 3

ACCT 2122[1] 3
ECON 1202[1] 3
GOAL VI: (X) 3
INFO 2130[1] 3
GOAL IV 4

Junior Year

OPER 3100 3
MGMT 3140 3
INFO 3130 3
Elective 3
Elective 3

OPER 3203 3
FINN 3120 3
MGMT 3160 (GOAL I: W) 3
MKTG 3110 3
OPER Elective 3

Senior Year

BLAW 3150 3
ECON 3125 3
OPER 3201 3
OPER 3206 3
Electives 6

MGMT 3280[2] 3
OPER Electives 6
OPER 3204 3
Elective 3

[1]Prerequisite for upper-division required business courses.
[2]To be taken after all 3000-level required business core courses have been filled.
[3]MATH 1141 (Differential and Integral Calculus I) may be substituted for MATH 1120.
Students preparing for graduate studies are advised to take MATH 1141.

Department of Marketing

Chairperson: Professor Swayne; *Professors*: C. Amato, Stevenson; *Professor Emeritus:* Weekly; *Associate Professors*: Bodkin; Gourdin, Shao; *Assistant Professor:* Martin

The Department of Marketing offers a curriculum suitable for students who are (1) planning to operate their own businesses and are seeking a solid business foundation, (2) preparing for positions in large organizations where specialized skills are required, and (3) seeking a strong background at the undergraduate level prior to undertaking graduate work.

The study of marketing provides students with an opportunity to prepare for careers in marketing management, sales, advertising, marketing research, retailing, logistics and transportation, and international marketing.

BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION

Students majoring in Marketing receive a Bachelor of Science in Business Administration degree with a major in Marketing. The B.S.B.A. degree requires a minimum of 120 semester hours, including 42 hours of core courses within the Belk College of Business Administration, 18 hours in the marketing major, nine hours of mathematics and statistics, and completion of the University general education requirements. In addition to the nine hours of mathematics and statistics, at least 42 hours of coursework must be taken outside the Belk College of Business Administration.

Courses which fulfill the College core and mathematics and statistics requirements are: ACCT 2121, 2122; BLAW 3150; ECON 1201, 1202 and 3125; FINN 3120; INFO 2130 and 3130; MGMT 3140, 3160 and 3280; MKTG 3110; OPER 3100; MATH 1100 and 1120; and STAT 1220.

MARKETING MAJOR

In addition to College core and mathematics and statistics requirements (51 hours) students majoring in Marketing must complete an additional 18 hours from the following courses: MKTG 3210 (Marketing Research and Analysis), MKTG 3211 (Advertising Management), MKTG 3212 (Retailing Management), MKTG 3213 (Professional Selling and Sales Management), MKTG 3215 (Global Marketing), MKTG 3216 (Consumer Behavior), MKTG 3217 (Logistics and Transportation), MKTG 3219 (Marketing Strategy), and MKTG 3800 (Directed Study). A student must have a GPA of at least 2.0 in the above 69 hours with no more than one D left standing. No course may be repeated more than twice. Consult the Department of Marketing for a suggested schedule to complete the BSBA degree with a major in Marketing.

Progression Requirements. To be accepted into a major and to progress into the upper division of the College, students must have: (1) attained junior standing; (2) completed ACCT 2121 and 2122; ECON 1201 and 1202; MATH 1120; and STAT 1220 with a "C" or better in each course; (3) earned at least a "C" in INFO 2130 (Introduction to Business Computing) or have passed the College Microcomputer Proficiency Test; and (4) filed an approved "Program of Study" in the College Office of Student Records.

Pre-business students who have earned at least 60 hours are permitted to enroll in core business courses if they have met the course prerequisites and have earned at least a "C" in INFO 2130 or have passed the College Microcomputer Proficiency Test. **Students must complete all progression requirements to be eligible to enroll in MGMT 3280 and the upper division business electives.**

Cooperative Education Program. Marketing majors may obtain practical work experience related to their major by participating in the cooperative education program. To be eligible for cooperative Education, students must be juniors who have an overall GPA of at least 2.5 and have completed the progression courses required by the Belk College of Business Administration. Transfer students must complete at least 12 hours at UNC Charlotte to be eligible for cooperative education. Completion of courses related to the co-op position may be required prior to the co-op work experience. These courses will be established by the Co-op Adviser. Students must complete either two full-time alternating semesters of work or three consecutive part-time work semesters while taking a reduced academic load of no more than 9 credit hours.

MARKETING MINOR

Students who have a GPA of 2.0 or better and are not majoring in a program in the Belk College of Businces Administration may elect a minor in Marketing. A minor in Marketing requires 21 hours to include MKTG 3110, ACCT 2121, ECON 1202 and any four of the following courses: MKTG 3210, 3211, 3212, 3213, 3215, 3216, 3217, 3219; MGMT 1140. A GPA of at least 2.0 is required in the 21 hours.

College of Education

Dean: Professor Nagle; *Assistant Dean and Director of the Teaching Fellows Program:* M. Spooner; *Director of the Office of Student Academic Services:* Hancock; *Director of the Office of Field Experiences:* V. Jaus; *Director of the Office of Educational Outreach:* Farrar; and *Director of the Mathematics and Science Education Center:* Wallace

Department of Counseling, Special Education, and Child Development

Chair: Professor Calhoun; *Professors*: Barret, Burke, Calhoun, Post, Robinson, Rowland, Test; *Associate Professors*: Anderson, Cooke, Nkomo, Pleasants, F. Spooner, White; *Assistant Professors*: Beattie, Carroll, Furr, Gallagher, Garrett, Lamorey, Nassar-McMillan, Wood; *Lecturers*: Gibbs, Springs

Department of Reading and Elementary Education

Chair: Associate Professor B. Edwards; *Professors*: H. Jaus, Wood; *Associate Professors:* Green, Nesbit, Passe, Piel, Rickelman, Wallace, Yon; *Assistant Professors:* Audette, Finke, Nichols, M. Spooner; *Clinical Assistant Professors*: Douville, Baucom; *Lecturers:* Frazier, Harrison

Department of Middle, Secondary, and K-12 Education

Chair: Professor Schaffer; *Professors*: Britt, Lock; *Assistant Professors*: Jones, Nason, Queen; *Lecturers*: Cockman, V. Jaus

Department of Educational Administration, Research, and Technology

Interim Chair: Vacant; *Professors:* Algozzine, Antonak, Ashbaugh, Gretes, Lyons, Nagle, Pittillo, Smith, Sorenson; *Associate Professor Emeritus:* Mork; *Assistant Professors*: Dardaine-Ragguet, Flowers

MISSION OF THE COLLEGE

Activities and programs in the College of Education are designed to foster effective schooling and the development of healthy, autonomous, lifelong learners. The mission of the College is two-fold: *to identify and create knowledge* that addresses the developmental and educational needs of children, youth, and their families; and *to disseminate this knowledge* through high quality initial preparation and continuing education programs for professionals who seek to be exceptionally competent in meeting those needs.

UNDERGRADUATE PROGRAMS

The College of Education has these undergraduate program responsibilities:

- To develop, deliver, and evaluate high quality undergraduate programs that prepare teachers and other professional personnel for schools and related agencies.
- To operate programs that meet the standards of external governing, licensing, and accrediting agencies.
- To address the culturally diverse educational needs of its particular region.
- To initiate and support activities that enrich the global perspectives of its faculty and students.
- To respond effectively to the problems and needs of children, their families, and professionals in schools and related agencies.

The College of Education offers undergraduate programs in Child and Family Development (licensure and non-licensure tracks), Elementary Education, Middle Grades Education, and Special Education: Mental Handicaps. In collaboration with selected departments in the College of Arts and Sciences, it offers professional education coursework that can lead to licensure to teach in the following areas of 9-12 Secondary Education: English, History, Mathematics, Comprehensive Social Studies, Biology, Chemistry, Earth Sciences, Physics, and Comprehensive Science; and in the following areas of K-12 Education: Art, Dance, Music, Theatre, German, French, and Spanish.

All professional education programs in the College of Education are approved by the North Carolina Department of Public Instruction (NCDPI), and they have continuing accreditation from the National Council for Accreditation of Teacher Education (NCATE). All programs that can be approved by content specialty associations recognized by NCATE (e.g., the National Council of Teachers of English, the National Science Teachers Association, the Council for Exceptional Children) have been reviewed and approved by those associations.

CHILD AND FAMILY DEVELOPMENT MAJOR: BACHELOR OF ARTS

Coordinator: Bobbie Rowland
Department: Counseling, Special Education, and Child Development (CSPC)

The Child and Family Development program leading to the B.A. degree prepares graduates to work in educational and related settings that serve infants, toddlers, preschoolers, and kindergartners who have typical and atypical needs. The licensure track prepares graduates for an entry-level ("A") license in birth-kindergarten (B-K) education.

Program Objectives. Graduates of the program are prepared to: apply their understanding of the various stages of growth and development of young children, the unique patterns with which children progress through these stages, and the factors that distinguish typical from atypical development; collect data on children's individual development and effectively access and utilize screening and assessment procedures for children with special needs; design, adapt, implement, and evaluate developmentally appropriate learning environments for children from birth through age eight; work collaboratively with families and with interdisciplinary teams from agencies that serve young children and their families; and demonstrate positive attitudes toward children and families and a strong

commitment to continuous lifelong study of young children.

Major in Child and Family Development with B-K Licensure:

Requirements. This major requires 124-128 semester hours as follows:

General Education (43-47 hours). Course options are listed on the program's Academic Planning Worksheet. Course selections must be initially approved by the student's Pre-Education adviser in the Office of Student Academic Services and finally approved by the student's major adviser after admission to the Teacher Education Program.

Child and Family Development (24 hours)
CHFD 2111 Child Study: Interpreting Children's Behavior (3)
CHFD 2412 Practicum I: Observing and Recording Children's Behavior (2)
CHFD 2113 Infant and Early Years (3)
CHFD 2114 Foundations of Preschool Education (3)
CHFD 2115 Education of the Young Child (3)
CHFD 2416 Practicum II: The Child and the Community (2)
CHFD 3113 Parent Education (3)
CHFD 3115 Learning and Development (3)
CHFD 3412 Practicum III: The Family and the Community (2)

Professional Education (29 hours)
EDUC 2100 An Introduction to Education and Diversity in Schools (3)
SPED 2100 Introduction to Students with Special Needs (2)

(Corequisite courses EDUC 2100 and SPED 2100 should be taken during a student's sophomore year; both must be completed with a grade of "C" or better to qualify for admission to the Teacher Education Program.

SPED 4110 Assessment in Special Education: Preschool (3)
SPED 4111 Issues in Preschool Education for Children with Disabilities (3)
SPED 4210 Instructional Methods and Materials: The Early Years (3)
CHFD 3410: Student Teaching/Seminar: B-K Child and Family Development (15)

(Enrollment in CHFD 3410 requires admission to student teaching through the College's Office of Field Experiences)

Related Courses (12 hours)
SOCY 2132 Sociology of Marriage and the Family (3)
SOCY 4632 Changing American Family (3) **and**
Two approved PSYC courses at or above the 3000 level that relate to cognitive, social, and/or personality development

Elective Courses (16 hours)
These courses must be approved by the student's adviser in child and family development.

Major in Child and Family Development (Non-Licensure Track):

Requirements. This major requires 124-128 semester hours as follows:

General Education (43-47 hours). Course options are listed on the program's Academic Planning Worksheet. Course selections must be approved by the student's major adviser.

Child and Family Development (39 hours)
CHFD 2111 Child Study: Interpreting Children's Behavior (3)
CHFD 2412 Practicum I: Observing and Recording Children's Behavior (2)
CHFD 2113 Infant and Early Years (3)
CHFD 2114 Foundations of Preschool Education (3)
CHFD 2115 Education of the Young Child (3)
CHFD 2416 Practicum II: The Child and the Community (2)
CHFD 3113 Parent Education (3)
CHFD 3115 Learning and Development (3)
CHFD 3412 Practicum III: The Family and the Community (2)
CHFD 3416 Internship in Child and Family Development (12)
CHFD 3619 Senior Seminar in Child and Family Development (3)

Related Courses (18 hours)
SOCY 2132 Sociology of Marriage and the Family (3)
SOCY 4632 Changing American Family (3) **and**
Two approved PSYC courses at or above the 3000 level that relate to cognitive, social, and/or personality development
and
Two approved courses in any one or two of these areas: nursing, anthropology, creative arts, social work, or psychology

Elective Courses (24 hours)
These courses must be approved by the student's adviser in child and family development.

Academic Advising. Freshmen and sophomores who intend to major in Child and Family Development and earn B-K licensure are classified as Pre-Education students in child and family development. They are assigned an adviser in the College's Office of Student Academic Services (OSAS), who helps them select appropriate general education courses for teacher licensure and who helps them meet the requirements for admission to teacher education. Upon admission to the Teacher Education Program in Child and Family Development, which typically occurs at the end of the sophomore year, students are assigned a major adviser in child and family development, who helps them plan the remainder of their program of study. Assignment of the student's major adviser is the responsibility of the chair of the Department of Counseling, Special Education, and Child Development (CSPC).

Freshmen and sophomores who intend to major in Child and Family Development, but do *not* want to earn B-K licensure, are assigned a major adviser in the child and family development program as soon as they declare their intention to major in that field. These advisers help students plan a program of study that will meet all requirements for graduation.

MAJOR IN ELEMENTARY EDUCATION: BACHELOR OF ARTS

Coordinator: Robert Audette
Department: Reading and Elementary Education (REEL)

The B.A. program in Elementary Education qualifies graduates for an entry-level ("A") license to teach grades K-6.

Program Objectives. Graduates of the program are prepared to: design, implement, and evaluate curriculum and instruction appropriate to stage of learning and development, cultural and linguistic background, and special learning needs; assess learning in grades K-6; teach appropriate concepts, skills, and learning strategies; organize and manage learning environments that promote students' active involvement and responsible, self-directed behavior; participate in continuously improving the elementary school; and engage in on-going evaluation and improvement of one's knowledge and teaching abilities.

Requirements. The major in Elementary Education leading to the B.A. degree requires 126 semester hours as follows:

General Education (51 hours). Course options are listed on the program's Academic Planning Worksheet. Course selections must be initially approved by the student's Pre-Education adviser in the Office of Student Academic Services and finally approved by the student's major adviser after admission to the Teacher Education Program in Elementary Education.

A Second Academic Concentration (24 hours, including two courses that also meet General Education Requirements) is required in *one* of the following six subject areas relevant to an elementary school classroom:

- English and Communications
- Mathematics
- Science
- Social Studies
- Global Studies and Foreign Language
- Visual and Performing Arts

The required and elective courses in each Second Academic Concentration are listed on the program's Academic Planning Worksheet. Course selections must be initially approved by the student's Pre-Education adviser in the Office of Student Academic Services and finally approved by the student's major adviser after admission to the Teacher Education Program in Elementary Education.

Professional Education Courses (54 hours)

EDUC 2100	An Introduction to Education and Diversity in Schools (3)
SPED 2100	Introduction to Students with Special Needs (2)

(Corequisite courses EDUC 2100 and SPED 2100 should be taken during a student's sophomore year; both must be completed with a grade of "C" or better to qualify for admission to the Teacher Education Program.

ELED 3120	The Elementary School Child (3)
ELED 3121	Measuring and Evaluating Learning in the Elementary School Curriculum (3)
MATH 2103	Fundamental Concepts in Mathematics III (3)
ELED 3122	Research and Analysis of Teaching Elementary School Learners (3)
ELED 3221	Teaching Science to Elementary School Learners (3)
HLED 3228	Teaching Health and Safety to Elementary School Learners (2)
PHED 3228	Integrating Physical Activity and Movement in Elementary Schools (2)
READ 3225	Teaching Reading to Elementary School Learners (W) (3)
ELED 3226	Teaching Language Arts to Elementary School Learners (3)
ELED 3223	Teaching Social Studies to Elementary School Learners (3)
ELED 3220	Integrating Curriculum for Elementary School Learners (4)
SPED 3290	Modifying Instruction for Learners with Diverse Needs (2)
ELED 3420	Student Teaching/Seminar: K-6 Elementary Education (15)

(Enrollment in ELED 3420 requires admission to student teaching through the College's Office of Field Experiences)

Elective (3 hours)
This course must be approved by the student's adviser in elementary education.

Academic Advising. Freshmen and sophomores who intend to major in Elementary Education are classified as Pre-Education students in elementary education. They are assigned an adviser in the College's Office of Student Academic Services (OSAS), who helps them select appropriate general education and Second Academic Concentration courses and who helps them meet the requirements for admission to teacher education. Upon admission to the Teacher Education Program in Elementary Education, which typically occurs at the end of the sophomore year, students are assigned a major adviser in elementary education, who helps them plan the remainder of their program of study. Assignment of the student's major adviser is the responsibility of the chair of the Department of Reading and Elementary Education (REEL).

MAJOR IN MIDDLE GRADES EDUCATION: BACHELOR OF ARTS

Coordinator: Jeanneine Jones
Department: Middle, Secondary, and K-12 Education (MDSK)

The B.A. program in Middle Grades Education qualifies graduates for an entry-level ("A") license to teach two of the following four content areas in grades 6-9: English/communication skills, mathematics, science, or social studies.

Program Objectives. Graduates of the program are prepared to: implement a middle grades philosophy to its fullest intent; design curriculum that is integrated, competency- and technology-based, and relevant to students' future academic and career expectations; transform their knowledge of two disciplines so that they are accessible to middle grades students; use teaching methods appropriate to the unique developmental needs of early adolescents; make informed decisions about curricular issues and instructional practices in middle grades education; demonstrate pervasive caring and innovative leadership in their work with students and colleagues; and function as lifelong learners.

Requirements. The major in Middle Grades Education leading to the B.A. degree requires 124-128 semester hours as follows:

General Education (38-42 hours). Course options are listed on the program's Academic Planning Worksheet.

Course selections must be initially approved by the student's Pre-education adviser in the Office of Student Academic Services and finally approved by the student's major adviser after admission to the Teacher Education Program in Middle Grades Education.

Second Academic Concentration (48 hours, including two courses in each Concentration that also meet General Education requirements).

Second Academic Concentrations are required in *two* of the following four subject areas relevant to a middle grades classroom:

- English and Communications Skills
- Mathematics
- Science
- Social Studies

The required and elective courses in each Second Academic Concentration are listed on the program's Academic Planning Worksheet. Course selections must be initially approved by the student's Pre-Education adviser in the Office of Student Academic Services and finally approved by the student's major adviser after admission to the Teacher Education Program in Middle Grades Education.

Professional Education (47 hours)

EDUC 2100 An Introduction to Education and Diversity in Schools (3)
SPED 2100 Introduction to Students with Special Needs (2)

(Corequisite courses EDUC 2100 and SPED 2100 should be taken during a student's sophomore year; both must be completed with a grade of "C" or better to qualify for admission to the Teacher Education Program in Middle Grades Education)

MDLG 3130 The Early Adolescent Learner (4)
MDSK 3150 Research and Analysis of Teaching Middle and Secondary School Learners (3)
HLED 3152 Health and Safety Issues in Middle and Secondary Schools (2)
MDSK 3151 Instructional Design and the Use of Technology with Middle and Secondary School Learners (3)
MDLG 3131 The Philosophy and Curriculum of Middle Grades Education (4)
READ 3255 Integrating Reading and Writing Across Content Areas (W) (3)
MDSK 3251 Teaching Science to Middle and Secondary School Learners (3) **and/or**
MAED 3232 Teaching Mathematics to Middle School Learners (3) **and/or**
MDSK 3253 Teaching Social Studies to Middle and Secondary School Learners (3) **and/or**
ENGL 4254 Teaching English/Communication Skills to Middle and Secondary School Learners (3)
SPED 3290 Modifying Instruction for Learners with Diverse Needs (2)
MDLG 3430 Student Teaching/Seminar: 6-9 Middle Grades (15)

(Enrollment in MDLG 3430 requires admission to student teaching through the College's Office of Field Experiences)

Elective (3 hours)
This course must be approved by the student's adviser in middle grades education.

Academic Advising. Freshmen and sophomores who intend to major in Middle Grades Education are classified as Pre-Education students in middle grades education. They are assigned an adviser in the College's Office of Student Academic Services (OSAS), who helps them select appropriate general education and Second Academic Concentration courses and who helps them meet the requirements for admission to teacher education. Upon admission to the Teacher Education Program in Middle Grades Education, which typically occurs at the end of the sophomore year, students are assigned a major adviser in middle grades education, who helps them plan the remainder of their program of studies. Assignment of the student's major adviser is the responsibility of the chair of the Department of Middle, Secondary, and K-12 Education (MDSK).

LICENSURE IN SECONDARY EDUCATION: BACHELOR OF ARTS OR BACHELOR OF SCIENCE

Coordinator: Eugene Schaffer
Departments: An appropriate department in the College of Arts and Sciences in collaboration with the Department of Middle, Secondary, and K-12 Education (MDSK) in the College of Education

The undergraduate program in Secondary Education qualifies graduates for an entry-level ("A") license to teach in one of the following subject areas in grades 9-12: English, History, Comprehensive Social Studies, Mathematics, Biology, Chemistry, Earth Sciences, Physics, or Comprehensive Science. Students major in an appropriate arts and sciences discipline and also complete a sequence of courses (including student teaching) in secondary education. The comprehensive social studies license builds on a major in history; the comprehensive science license builds on a major in earth sciences.

Program Objectives. Graduates of the secondary education program are prepared to: design curriculum that is integrated, competency- and technology-based, and relevant to students' future academic and career expectations; transform their knowledge of a discipline so that it is accessible to high school students; use teaching methods appropriate to the unique developmental needs of adolescents; make informed decisions about curricular issues and instructional practices in secondary education; demonstrate pervasive caring and innovative leadership in their work with students and colleagues; and function as lifelong learners, especially in their discipline.

Degree Requirements. The undergraduate program in secondary education requires a major in the College of Arts and Sciences in a discipline relevant to the curriculum in grades 9-12 and a maximum of 128 hours as follows:

General Education (26-41 hours). These course requirements vary with a student's academic major in arts and sciences and are defined by faculty in each major.

Core and Related Courses in an Appropriate Arts and Sciences Major (30-78 hours). Academic majors relevant to secondary education include English, History, Mathematics, Biology, Chemistry, Earth Sciences, and Physics. The requirements for each major are defined by faculty in that major.

Secondary Education (44 hours)

EDUC 2100	An Introduction to Education and Diversity in Schools (3)
SPED 2100	Introduction to Students with Special Needs (2)

(Corequisite courses EDUC 2100 and SPED 2100 should be taken during a student's sophomore year; both must be completed with a grade of "C" or better for the student to qualify for admission to the Teacher Education Program in the selected field of secondary education)

SECD 2140	The Adolescent Learner (3)
SECD 3141	Secondary Schools (3)
MDSK 3150	Research and Analysis of Teaching Middle and Secondary School Learners (3)
MDSK 3151	Instructional Design and the Use of Technology with Middle and Secondary School Learners (3)
HLED 3152	Health and Safety Issues in Middle and Secondary Schools (2)
SECD 3142	Issues in Secondary Education (2)
SPED 3290	Modifying Instruction for Learners with Diverse Needs (2)
MDSK 3251	Teaching Science to Middle and Secondary School Learners (3) **or**
MAED 3252	Teaching Mathematics to Secondary School Learners (3) **or**
MDSK 3253	Teaching Social Studies to Middle and Secondary School Learners (3) **or**
ENGL 4254	Teaching English/Communication Skills to Middle and Secondary School Learners (3)
READ 3255	Integrating Reading and Writing Across Content Areas (W) (3)
SECD 3441	Student Teaching/Seminar: 9-12 Secondary Science (15) **or**
SECD 3442	Student Teaching/Seminar: 9-12 Secondary Mathematics (15) **or**
SECD 3443	Student Teaching/Seminar: 9-12 Secondary Social Studies (15) **or**
SECD 3444	Student Teaching/Seminar: 9-12 Secondary English (15)

(Enrollment in one of these four courses requires admission to student teaching through the College's Office of Field Experiences)

Elective Courses
These courses must be approved by the student's adviser in his or her arts and sciences major.

Academic Advising. Freshmen and sophomores who intend to major in an arts and sciences discipline and also earn a related license to teach in secondary education (grades 9-12) are classified as Pre-education students. They are assigned both a general adviser in arts and sciences, who helps them select appropriate general education courses and lower division courses in their major, and a Pre-Education adviser in the College of Education's Office of Student Academic Services (OSAS), who helps them meet the requirements for admission to teacher education. Upon admission to the Teacher Education Program in their selected field of secondary education, which typically occurs at the end of the sophomore year, students are assigned an adviser in secondary education, who helps them plan the remainder of their program of study in secondary education. Assignment of the student's secondary education adviser is the responsibility of the chair of the Department of Middle, Secondary, and K-12 Education (MDSK).

MAJOR IN SPECIAL EDUCATION: BACHELOR OF ARTS

Coordinator: Mary Lynne Calhoun
Department: Counseling, Special Education, and Child Development (CSPC)

The B.A. program in Special Education: Mental Handicaps qualifies graduates for an entry-level ("A") license to teach children with mental handicaps in grades K-12. Enrollment in the program is limited to 25 students each year.

Program Objectives. Graduates of the program are prepared to: provide individually planned, systematically implemented, and carefully evaluated instruction for students with mental handicaps; provide educational services to students with mental handicaps in regular classrooms, resource classrooms, and consultative settings; and help students with mental handicaps achieve the greatest possible personal self-sufficiency and success in present and future environments.

Requirements. The major in Special Education: Mental Handicaps leading to the B.A. degree requires 128 semester hours as follows:

General Education (45 hours). Course options are listed on the program's Academic Planning Worksheet. Course selections must be initially approved by the student's Pre-Education adviser in the Office of Student Academic Services and finally approved by the student's major adviser after admission to the Teacher Education Program in Special Education: Mental Handicaps.

Second Academic Concentration (24 hours, including two courses that also meet General Education requirements).

A Second Academic Concentration is required in *one* of the following six subject areas relevant to teaching children with mental handicaps in an elementary, middle, or secondary school classroom:

- English and Communications
- Mathematics
- Science
- Social Studies
- Global Studies and Foreign Language
- Visual and Performing Arts

The required and elective courses in each Second Academic Concentration are listed on the program's Academic Planning Worksheet. Course selections must be initially approved by the student's Pre-Education adviser in the Office of Student Academic Services and finally approved by the student's major adviser after admission to the Teacher Education Program in Special Education: Mental Handicaps.

Professional Education (62 hours)

EDUC 2100	An Introduction to Education and Diversity in Schools (3)
SPED 2100	Introduction to Students with Special Needs (2)

(Corequisite courses EDUC 2100 and SPED 2100 should be taken during a student's sophomore year; both must be completed with a grade of "C" or better to qualify for admission to the Teacher Education Program in Special Education: Mental Handicaps.)

CHFD 3115	Learning and Development (3) **or**
MDSK 3160	Learning and Development: Birth through Adolescence (3) **or**
PSYC 2120	Child Psychology (3) **or**
PSYC 2121	Adolescent Psychology (3)
SPED 3171	The Education of Learners with Mental Handicaps (3)
SPED 3172	Directed Readings in Special Education Research (3)
SPED 3173	Special Education Assessment (3)
READ 3225	Teaching Reading to Elementary School Learners (W) (3)
SPED 3174	Classroom-Based Assessment (3)
SPED 4276	Teaching Language Arts to Learners with Mental Handicaps (3)
SPED 4270	Classroom Management (3)
HLED 3228	Teaching Health and Safety to Elementary School Learners (2) **or**
HLED 3152	Health and Safety Issues in Middle and Secondary Schools (2)
PHED 3228	Integrating Physical Activity and Movement in Elementary Schools (2)
SPED 3290	Modifying Instruction for Learners with Diverse Needs (2)
SPED 3272	Teaching Mathematics to Learners with Mental Handicaps (3)
SPED 3273	Teaching Life Skills to Learners with Mental Handicaps (3)
SPED 4170	Special Education Consultation and Collaboration (3)
EIST 4100	Computer Applications in Education (3)
SPED 3470	Student Teaching/Seminar: K-12 Special Education: Mental Handicaps (15)

(Enrollment in SPED 3470 requires admission to student teaching through the College's Office of Field Experiences)

Elective (3 hours)
This course must be approved by the student's adviser in special education.

Academic Advising. Freshmen and sophomores who intend to major in Special Education: Mental Handicaps are classified as Pre-Education students in special education. They are assigned an adviser in the College's Office of Student Academic Services (OSAS), who helps them select appropriate general education and Second Academic Concentration courses and who helps them meet the requirements for admission to teacher education. Upon admission to the Teacher Education Program in Special Education: Mental Handicaps, which typically occurs at the end of the sophomore year, students are assigned a major adviser in special education, who helps them plan the remainder of their program of study. Assignment of the student's major adviser is the responsibility of the chair of the Department of Counseling, Special Education, and Child Development (CSPC).

LICENSURE IN K-12 EDUCATION IN FOREIGN LANGUAGES AND IN THE FINE AND PERFORMING ARTS

The Department of Middle, Secondary, and K-12 Education (MDSK) in the College of Education assists departments in the College of Arts and Sciences to serve students interested in K-12 licensure for teaching French, German, Spanish, Art, Dance, Music, or Theatre Arts.

TEACHER EDUCATION POLICIES AND PROCEDURES

Admission to a Teacher Education Program. Students should apply for admission to a specific teacher education program during their sophomore year, and they must complete the admissions process before enrolling in any professional education courses at the 3000-level or higher.

Minimum requirements for admission to all teacher education programs at UNC Charlotte include:

1. An overall GPA of at least 2.5 in a minimum of 45 semester hours in university courses;
2. A grade of C or higher in both EDUC 2100 and SPED 2100;
3. Passing scores on the Praxis I: Academic Skills Assessments; and
4. Approval of the chair (or his or her designee) of the department that offers the program.

Some teacher education programs have additional requirements for admission (e.g., references, an interview, additional tests). Information about these additional requirements and about procedures for applying for admission to a teacher education program can be obtained in the Office of Student Academic Services in the College of Education.

Retention in a Teacher Education Program. There are two minimum requirements for retention in a teacher education program:

1. A grade of C or higher (a) in all professional education courses *and* (b) in all courses in the student's area of teaching specialization; and
2. A GPA of 2.5 or higher (a) overall, (b) in all professional education courses, *and* (c) in the student's area of teaching specialization.

Some teacher education programs have additional requirements for retention. Information about these additional requirements can be obtained in the Office of Student Academic Services in the College of Education.

Admission to Student Teaching. Students must be formally admitted to student teaching before enrolling in a student teaching experience during the second semester of their senior year. This process and subsequent placement in a school occur during the semester prior to student teaching.

Minimum requirements for admission to student teaching include:

1. Senior status;
2. Completion of *all* other course work in a student's program of study;
3. Grades of C or higher in all professional education courses *and* a GPA of 2.75 or higher in those courses;
4. A GPA of 2.75 or higher in the student's area of teaching specialization;
5. An overall GPA of. 2.50 or higher in the student's total program of study; and
6. A recommendation from the student's faculty adviser(s) certifying readiness to student teach.

Some teacher education programs have additional requirements for admission to student teaching. Information about these additional requirements and about procedures for applying for admission to student teaching in all programs can be obtained in the Office of Field Experiences in the College of Education.

SUPPORT OFFICES AND SPECIAL RESOURCES

The Office of Student Academic Services (OSAS). Located in Room 3022 of Colvard South, this office serves all students involved in Teacher Education programs. The staff, including three full-time academic advisers, is responsible for:

- Promotion of teacher education programs and recruitment of students during the two years prior to their admission to UNC Charlotte;
- Orientation and academic advisement of Pre-Education students prior to their admission to a specific Teacher Education Program (which typically occurs late in their sophomore year);
- Academic support services for both students and their faculty advisers as students admitted to a teacher education program progress through their programs, complete student teaching, and apply for licensure; and
- Follow-up contacts with graduates for purposes of both program and product evaluation.

In collaboration with academic departments involved in teacher education, the Office of Student Academic Services is the College of Education's central source of information about academic program requirements; criteria and procedures for admission to a specific teacher education program; faculty-student advising assignments; schedules and applications for taking Praxis I and Praxis II examinations; requirements and procedures for obtaining licensure in North Carolina (or in other states that have reciprocity agreements with North Carolina), including the state's new licensure requirements for demonstration of basic and applied technology competencies; and final audits to ensure completion of all program and licensure requirements.

The Office of Field Experiences (OFE). Located in Room 3027 of Colvard South, this office provides both support services and some direct instruction for the many clinical experiences that students complete for courses and during student teaching. Field experiences -- observing, interacting with, and teaching children -- are a critical part of all undergraduate teacher education programs at UNC Charlotte. Early clinical experiences are linked to specific courses, designed by the instructors of those courses, and described in course syllabi. These field experiences continue throughout a student's program, progressing from observation and note-taking to interaction with children for individual or group instruction. They culminate in a 15-week, full-time student teaching experience that occurs after completion of all other course work.

Special Facilities and Resources. The following special facilities and resources support the work of both faculty and students in teacher education programs:

- Two *model classrooms*, Rooms 5090 and 5091 in Colvard North, one for science and mathematics and the other for reading, language arts, and social studies.
- An *instructional technology classroom* in Room 3120 of Colvard South.
- An *open instructional technology laboratory* in Room 3040 of Colvard South.
- An *interactive videotaping laboratory* in Room 3057 of Colvard South for one-on-one and small group assessment and instruction.
- The *Curriculum and Instructional Materials Center* in Atkins Library, serves as a laboratory for reviewing and experimenting with BK-12 curriculum and instructional materials, including elementary, middle, and secondary school textbooks, standardized tests, software and courseware, curriculum guides, instructional games and kits, and professional monographs and pamphlets.
- *Media Services* in Atkins Library, maintains an extensive collection of audiovisual equipment and provides graphic and television production services to support instruction
- The *Mathematics and Science Education Center*, sponsors a wide variety of programs and projects that involve preservice and inservice teachers and that are designed to enhance the quality of instruction in mathematics and science for both pre-college and university students
- The *Office of Educational Outreach* in the College of Education, fosters collaborative relationships between schools and UNC Charlotte by developing, supporting, and publicizing activities and projects that involve UNC Charlotte students and faculty in public school systems throughout the University's service region.

The Teaching Fellows Program. Each year, the North Carolina Teaching Fellows Program provides a $5,000-per-year scholarship to 400 outstanding North Carolina high school seniors who commit to enroll in a teacher education program and who agree to teach in the state's public schools for a minimum of four years after graduation.

The Teaching Fellows Program in the College of Education enrolls approximately 100 students and emphasizes scholastic achievement, professional development, and personal attention and development. Four faculty members serve as class sponsors and work with the same cohort of Teaching Fellows throughout their four years in the program. In addition to their regular course work, Teaching Fellows participate in an on-going seminar and in special activities (retreats, cultural events, clinical experiences, summer teaching internships, etc.) that are designed to help them develop multicultural awareness, interpersonal skills, and leadership abilities.

Applications for the Teaching Fellows Program must be completed in the fall of a student's senior year in high school. Information can be obtained from high school counselors, the North Carolina Teaching Fellows Commission, the director of UNC Charlotte's Teaching Fellows Program, or staff in the College of Education's Office of Student Academic Services.

Undergraduate Student Organizations and Awards. Organizations that are especially relevant to undergraduate students in teacher education programs include:

- The *Student North Carolina Association of Educators (SNCAE)*, affiliated with the North Carolina Association of Educators (NCAE) and the National Education Association (NEA).

- The *Student Council for Exceptional Children (SCEC)*, affiliated with the Council for Exceptional Children (CEC).
- The *Omicron Pi Chapter of Kappa Delta Pi*, an international honor society for students in education.

Awards and scholarships that recognize the achievements of undergraduate students in teacher education programs include:

- *The Education Award*, presented annually to two seniors who have demonstrated leadership and scholarship and who plan to teach.
- *The Phi Kappa Phi Scholar Award*, presented annually to a junior majoring in a program in the College of Education who demonstrates outstanding leadership in an academic discipline and in research or independent study.
- *The Francis M. Fitzgerald Award*, presented annually by the National Conference of Christians and Jews to two seniors who demonstrate superior understanding of and cooperation with their fellow human beings and who plan to teach.
- *The Military Order of the Purple Heart Award,* presented annually by the American Association of Colleges for Education to two juniors majoring in programs in the College of Education who have shown scholarly achievement, teaching ability, and concern for the educational rights of children with disabilities.
- *The North Carolina Alpha Chapter of Alpha Delta Kappa Memorial Scholarship*, awarded annually to a student who has been admitted to a teacher education program and demonstrated both outstanding academic performance and a commitment to teaching.

More information about these organizations and awards for undergraduate students in teacher education is available in the Office of Student Academic Services in the College of Education.

The William States Lee College of Engineering

Dean: Professor Snyder; *Associate Dean*: Professor Leamy; *Assistant Dean*: Middleton

The William States Lee College of Engineering offers baccalaureate degree programs in engineering, engineering technology, and computer science. On the graduate level, the College offers programs leading to master's degrees in engineering and computer science, the Ph.D. in electrical engineering and mechanical engineering, and, in cooperation with North Carolina State University, a program leading to the Ph.D. degree in engineering and computer science. (For more information regarding graduate programs in engineering, see the *Graduate Section* of this *Catalog*.)

The College comprises the Departments of Civil Engineering, Electrical Engineering, Mechanical Engineering and Engineering Science, Engineering Technology, and Computer Science.

The engineering programs offer professional engineering education to prepare students for careers as professional engineers and researchers. The engineering technology programs are designed to provide graduates of two-year associate degree engineering technology programs an opportunity to continue their education at the baccalaureate level and to pursue careers as engineering technologists. The computer science program prepares students for careers in information science, computer engineering, and general computer science.

Engineering Programs. The baccalaureate programs in engineering offer a professional engineering education that can be used as the foundation for several different career objectives: careers as professional engineers in industry, business or consulting; graduate study to prepare for careers in research, development or teaching; and a more general and more liberal engineering education with the objective of keeping a variety of career avenues open.

Whatever the career objective of the student, a sound engineering educational program must include substantial content in: (1) the humanities and social sciences, (2) the physical sciences, (3) mathematics, and (4) the engineering sciences. Also, (5) there must be an in-depth experience in creative engineering design. The student expecting to accept employment in industry may emphasize the engineering design and engineering science aspects of his or her program, while the student preparing for graduate study might emphasize the mathematics and science aspects. Some engineering graduates ultimately take on executive and management responsibilities in industries and firms which are based upon engineering products and engineering services. Such students may choose to construct an elective option in their program which includes business administration and economics offerings, and other courses to strengthen their communication skills.

The engineering curricula prescribed by the faculty of UNC Charlotte give thorough attention to the five essential components of a sound program of study. Those elements which are considered basic to every program of study are specified in each curriculum outline and result in freshman requirements which are essentially the same for all engineering students. The common basic core serves as the educational foundation for the professional engineering courses later in the program and provides solid preparation for the first step in the professional engineering registration process.

Engineering students are strongly encouraged to pursue the requirements for registration as a Professional Engineer. The first step in the registration process is the successful completion of the Fundamentals Exam (also known as the EIT--Engineer in Training--Exam). Students are encouraged to take this exam during their last semester prior to graduation. Additional requirements subsequent to graduation include the accumulation of at least four years of progressive engineering experience and successful completion of the Principles and Practice Exam.

Engineering Technology Program. Engineering technology is the profession in which a knowledge of mathematics and natural sciences gained by higher education, experience, and practice is devoted primarily to the implementation and extension of existing technology for the benefit of humanity. Engineering technology education focuses primarily on the applied aspects of science and engineering aimed at preparing graduates for practice in that portion of the technological spectrum closest to the product improvement, manufacturing, and engineering operational functions.

Engineering technology programs are characterized by their focus on application and practice, and by their approximately 50/50 mix of theory and laboratory experience.

Graduates of the engineering technology program are recruited by most major technological companies in the U.S. They are employed across the technological spectrum, but are better suited to areas that deal with application, implementation, and production, as opposed to the conceptual design and research functions. The technical sales and customer services fields also account for many placements.

Computer Science Program. The Computer Science Department offers a wide variety of programs to match the diverse requirements of employers. The computer science major may pursue either a bachelor of science or a bachelor of arts degree.

The bachelor of science program offers the student two very different concentrations: computer science or computer engineering. The computer science option is centered on software development and has a substantial requirement in mathematics and physics. Theoretically based, this program prepares students to continue their education in master's or doctoral programs, or to enter the business world as a computer scientist. The computer engineering option prepares the graduate to enter the computer industry either as a computer hardware design engineer or as a computer scientist with a heavy dose of mathematics, the physical sciences, and electrical engineering.

The bachelor of arts options are in computer science and information science. As in the bachelor of science program, the computer science concentration prepares the student to enter the business world as a computer scientist. The emphasis in this program is less theoretical and mathematical, and more on the applied side. The information science option provides the student with the opportunity to emphasize the information processing aspects of computer science. This concentration emphasizes the interface between the human element and the computer as well as the processing of information. This emphasis also includes a series of courses from the Belk College of Business Administration.

The curriculum provides flexibility for the student to tailor a program to meet her or his needs and objectives. For the computer science option in the bachelor of science or bachelor of arts degrees, the student must select a minimum of 15 hours outside of computer science in which to study. This "minor-like" program allows the student to select from the full spectrum of University programs and majors, including the University Honors Program.

ACADEMIC PROGRESSION REQUIREMENTS: BACHELOR'S DEGREE PROGRAMS IN ENGINEERING

I. **Freshman Engineering** is essentially a freshman advising program for students who meet the requirements for admission as an engineering major, but who are not admitted directly to one of the engineering degree programs. Freshman Engineering students may be admitted to the lower division after completing the freshman year of study and meeting these requirements:

1. Maintain a GPA of at least 2.0.
2. Achieve a grade of C or better in CHEM 1251, MATH 1241, 1242, PHYS 2101, ENGR 1201 and 1202.
3. Retake (i.e., take again for a new grade) of no more than *two* courses in mathematics, physics, and engineering. *In no case may a single course be repeated more than once* (i.e., taken for a grade more than twice) without the Dean's approval.

II. **Lower Division** is essentially the first two years of study. Although the content is not identical for the three major programs (civil, electrical, and mechanical engineering), the academic progression requirements are the same for all students majoring in engineering (including those who have not declared a specific major):

1. Maintain an overall GPA of at least 2.0 and an engineering course GPA of at least 2.0.
2. Achieve a grade of *C* or better in CHEM 1251, MATH 1241, 1242, PHYS 2101, ENGR 1201 and 1202.
3. Retake a total of no more than three courses in mathematics, physics, and engineering. In no case may a single course be repeated more than once (i.e., taken for a grade more than twice) without the Dean's approval.

III. **Upper Division** is essentially the last two years of study in an engineering major. There are no undecided majors in the upper division.

1. A student can be admitted to the upper division from the lower division of a department only upon satisfactory completion of 59 hours of lower-division courses including all freshman-year courses, all required mathematics courses, and all required lower division courses in the major. Consequently, transfer students normally are admitted initially to the lower division of the bachelor's degree program. Also, students who change their major into engineering normally are admitted only to the lower division of the program.
2. A student in the lower division may, with the approval of the adviser, take no more than 12 credit hours of upper-division courses. In no case may a student in the lower division take an upper-division course which has another upper-division course as a prerequisite.
3. A student may retake no more than three engineering courses in the upper division. In no case may a single course be retaken more than once (i.e., taken for a grade more than twice) without the Dean's approval.

IV. **Discontinuance:** A student who is deemed to be making unsatisfactory academic progress will be recommended for discontinuance from the bachelor's degree program. Some of the conditions under which students will be recommended for discontinuance include:

1. Failure to satisfy the requirements in I, II or III above or to be admitted to the upper division.
2. Failure to satisfy any prerequisite course after one retaking of that course.
3. Receiving two *F's* in any course in the program.
4. Compiling a grade point deficit of 14 or more in engineering courses.
5. Two successive semesters with a cumulative GPA of less than 2.0 in engineering courses.
6. Failure to satisfy the University academic progression requirements.

The procedure for appeal of any discontinuance decision follows the standard policies of the departments of the William States Lee College of Engineering. See the section of this catalog on *Academic Policies and Degree Requirements* for the regulations and procedures pertaining to readmission.

SPECIAL COLLEGE PROGRAMS

Cooperative Education Program. Students in The William States Lee College of Engineering may obtain practical work experience while pursuing their degree by participating in cooperative education whereby a student alternates semesters of academic study with semesters of work experience in industry. The work experience is under the direction of the student's major department and is closely related to his or her field of study. Civil engineering, electrical engineering, and mechanical engineering students who complete the Co-op program may receive partial credit toward the experience requirement for registration as a Professional Engineer.

To be eligible for the Co-op program, an engineering or computer science student must have completed at least 24 credit hours at UNC Charlotte including a number of specified courses with a minimum GPA of 2.50. A

transfer student is expected to have completed at least 12 hours at UNC Charlotte. An engineering technology student must have earned an Associate of Applied Science degree with a GPA of 2.5 or better (out of 4.0).

For an undergraduate to be officially designated as a Co-op student, he or she must participate in at least three semesters of work experience (two semesters for a computer science major). Consequently, participation in Co-op Education usually means that the student will take five years to complete the engineering or computer science programs or three years (at UNC Charlotte) to complete the engineering technology program.

Students interested in learning more about the advantages and opportunities of participating in this program should contact the University Career Center.

Internships. A number of opportunities for internships exist for students in the College. These internships may be with or without pay and with or without academic credit. Students interested in learning more about these opportunities should consult with their adviser and with the engineering program coordinator in the University Career Center.

International Option. The International Option Program, available to all students within the College of Engineering, consists of two phases. Phase 1 (Internationalized General Education) normally completed during the freshman and sophomore years, consists of studying a foreign language and approved internationally-oriented courses. Phase 2 (Experience Abroad) provides for overseas study, research, and/or an industrial experience. While participation in both phases is recommended, students completing either phase will have their transcripts so noted. Students completing both phases will have a notation made to their transcripts as having a "Certificate of International Studies."

Transfer students, including engineering technology majors, may also participate in the International Option Program. Transfer students may find it difficult to complete Phase I of the program without affecting their anticipated graduation date, depending on the credits transferred to UNC Charlotte.

Mentoring Program. The College has developed a peer mentoring program to assist its students to develop the personal and academic skills needed for success. The program includes peer-to-peer mentoring in individual or small group sessions with skills assessment, and workshops and supplemental instruction for several engineering, computer science and engineering technology courses.

CONTINUING ENGINEERING STUDIES

The William States Lee College of Engineering sponsors various special educational programs for practicing engineers, technologists, technicians, and others in addition to its regular academic degree programs and courses. These include conferences, short courses, seminars, and other continuing education programs designed to aid those practicing in the technical professions and occupations to keep abreast of the latest developments in the rapidly expanding technology. The courses listed below are offered on a periodic basis, while many others are offered on demand.

PROFESSIONAL ENGINEERING-BASICS. Forty-five hours of work reviewing mathematics, chemistry, economics and the basic engineering sciences as preparation for the Professional Engineering Fundamentals (EIT or Exam I) Examination.

PROFESSIONAL ENGINEERING-APPLIED. Fifty-five hours of work reviewing applications in chemical, civil, electrical and mechanical engineering and engineering economics as preparation for the Professional Engineering Principles and Practice (PE or Exam II) Examination.

For further information about these courses or to request special offerings, contact the Office of Continuing Education, Extension, and Summer Programs.

LIBERAL ENGINEERING STUDIES

The impact of technology on the present condition and future prospects of humankind has until recently received little formal study. The William States Lee College of Engineering has attempted to respond to a sincere concern on the part of many students who realize that there are important social and environmental problems resulting from the radical present and future changes in technology. It is the aim of Liberal Engineering Studies to put these problems and their possible technical solutions into perspective. Liberal Engineering courses are intended primarily for non-engineering students to explore various societal-technological interactions.

Department of Civil Engineering

Chairperson: Associate Professor Young; *Professors*: Bayer, Evett, Janardhanam, King, Wu; *Assistant Professors*: Graham, Kane, Lindenauer, Stadler; *Lecturer:* Hilger

A major role of civil engineers is to focus scientific and technological skills on the creation of physical facilities, engineering and construction of which advance society toward such basic goals as economic development, environmental protection and social well-being. Civil engineers may be involved in design and construction of buildings, bridges, dams and other structures; in development of water resources for urban use, industry and land reclamation; in transmission of water and control of rivers; in control of water quality through purification and proper waste treatment; in transportation systems including highways, mass transit, airports, railroads, pipelines, canals and harbor facilities; in problems associated with the environment including air pollution, noise pollution, ecological effects, land development, urban and regional planning; and in a wide range of services--all involving health, safety and welfare of the public. Civil engineers must bring about a satisfactory blending of constructed facilities with the natural and social environments, creating an optimum relationship between humans and the environment.

The objective of the Civil Engineering program is to provide students with the latest technology and

opportunities to develop the social science and management skills required to assess needs, evaluate social and environmental impacts, and operate engineering systems. Such opportunities are ensured through the broad curriculum found in the Department and the encouragement of interactions with other departments and colleges of the University.

The Department offers a Bachelor of Science in Civil Engineering (B.S.C.E.) degree and administers a program leading to a Master of Science in Civil Engineering (M.S.C.E.) degree and a Master of Science in Engineering (M.S.E.) degree. Doctoral studies leading to the Doctor of Philosophy (Ph.D.) degree are available through a cooperative arrangement with North Carolina State University. For information about the master's programs, see the *Graduate Section* of this *Catalog*.

Students may plan early in their undergraduate careers for continuation of their engineering studies beyond the first degree. The large number of fields of graduate study that can logically follow the curriculum offered by the Department of Civil Engineering may influence how each student plans a program of study. Technical electives allow flexibility for study in specific areas, and each student will design a technical elective program with his or her adviser's advice and approval in order to achieve an individual goal.

Additionally, students may take 9 hours (3 "Optional Courses") beyond the BSCE requirements from prescribed menus in each of the areas of Environmental, Geotechnical, Structural, and Transportation Engineering to earn a Department-issued "Area of Concentration." Qualified students may apply for early entry into the graduate program in Civil Engineering during their junior or senior year and, if accepted, may take these optional courses for graduate credit. For information on this early entry or 5th year Master's Program, see the Graduate Section of this *Catalog*.

The program in Civil Engineering is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

BACHELOR OF SCIENCE IN CIVIL ENGINEERING (B.S.C.E.)

This curriculum became effective Fall 1995. Students entering the program prior to Fall 1995 should refer to a previous catalog or contact the Department office for their program of study. Other students should contact the Department office for the latest information concerning this curriculum.

A major in Civil Engineering leading to the B.S.C.E. degree consists of 120 credit hours. Specific requirements are:

English	6
Technical Communications	3
Humanities and Social Science Electives	15
Mathematics	15
Physics	8
Chemistry	4
Science Elective	6
Engineering	4
Electrical or Mechanical Engineering	3
Engineering Science	9
Departmental Requirements	38
Technical Electives	9
	120

Social science and humanities electives must be chosen both to satisfy Goals III, V and VI of University general education requirements and to meet the objectives of a broad education consistent with the educational goals of the profession. These electives must include some courses at an advanced level.

The science electives must be chosen from the physical, life or earth sciences and must complement the student's overall educational plan.

Technical electives allow flexibility for study in specific areas, and each student will design a technical elective program with the adviser's advice and approval in order to achieve an individual goal. The technical electives may be selected from the areas of engineering, mathematics, science, business and communications.

CURRICULUM OUTLINE: B.S.C.E. DEGREE
(effective Fall 1995)

Freshman Year

MATH	1241	Calculus I	3
CHEM	1251	Chemistry I	3
CHEM	1251L	Chemistry Lab	1
ENGL	1101	English I	3
ENGR	1201	Introduction to Engineering I	2
HUM/SS		Elective	3
			15

MATH	1242	Calculus II	3
PHYS	2101	Dynamics	3
PHYS	2101L	Physics Lab	1
ENGL	1102	English	3
ENGR	1202	Introduction to Engineering II	2
HUM/SS		Elective	3
			15

Sophomore Year

MATH	2241	Calculus III	3
PHYS	2102	Electricity	3
PHYS	2102L	Physics Lab	1
CEGR	2101	Drawing	2
CEGR	2103	CE Measurement & Analysis	2
ESGR	2141	Statics (Engr. Mech. I)	3
TECHNICAL COMMUNICATIONS Elective			3
			17

MATH	2171	Differential Equations	3
CEGR	2102	Engineering Economic Analysis	2
CEGR	2104	Surveying & Site Design	3
ESGR	2142	Dynamics (Engr. Mech. II)	3
ESGR	2144	Solid Mechanics	3
CEGR	2154	Design Project Lab	2
			16

Junior Year

CEGR	3143	Hydraulics & Hydrology	3
CEGR	3141	Environmental I	3
CEGR	3155	Environmental Lab	1
CEGR	3161	Transportation I	3
CEGR	3153	Transportation Lab	1
MATH		Elective	3
SCIENCE		Elective	3
			17

CEGR	3278	Geotechnical Engineering	3
CEGR	3258	Geotechnical Lab	1
CEGR	3122	Structural Analysis	3
SCIENCE		Elective	3
HUM/SS		Elective	3
* Optional Course A			(3)
			13

Senior Year

CEGR	3225	Concrete I	
	or		3
CEGR	3221	Steel I	
CEGR	3255	Structural Materials Lab	1
CEGR	3201	Systems and Design I	3
TECH		Elective	3
HUM/SS		Elective	3
* Optional Course B			(3)
			13

EEGR	2161	Circuits	
	or		3
MEGR	3111	Thermodynamics	
CEGR	3202	Systems and Design II	1
CEGR	3282	Professional Development	1
TECH		Elective	3
TECH		Elective	3
HUM/SS		Elective	3
* Optional Course C			(3)
			14

Total Required Hours 120

*Contact the Department office for more information about the optional courses.

Department of Computer Science

Chairperson: Professor Quinn; *Associate Chairperson:* Associate Professor Lejk; *Professors*: Allen, Michalewicz, Ras, Revesz; *Professor Emeritus*: Epstein, Schell; *Associate Professors*: K. Chen, Chu, Hadzikadic, Mostafavi, Razavi, Wilkinson, Xiao; *Assistant Professors*: Long, Tolone; *Lecturers*: Shaw; *Adjunct Professors*: Jaeger, Nelson, Pawlak; *Faculty Associate*: J. Robinson

Computer Science is the term applied to areas of study centering on the organizational and structural properties of systems, arrays of symbols, and mechanical languages which find their application in the processing and communication of information. The computer scientist's concerns are:

- the organization and interaction of equipment constituting an information processing system,
- the development of software systems to control and communicate with equipment,
- the derivation and study of procedures and basic theories for the specification of processes, and
- the application of systems, software, procedures, and theories of computer science to other disciplines.

The Computer Science Department offers programs leading to three degrees: Bachelor of Arts, Bachelor of Science, and Master of Science. (See the *Graduate Section* of this *Catalog* for information on the M.S. degree.) Students are prepared for their profession through a comprehensive program of courses, aided by some of the latest computer equipment available.

Cooperative Education in Computer Science. By participating in the Cooperative Education program, students in computer science may pursue their education along with alternating work experiences so that they may be better prepared to enter their chosen professional career. Interested students should contact the Department of Computer Science for more information.

BACHELOR OF ARTS: COMPUTER SCIENCE

The *Computer Science Concentration* consists of 42 hours in computer science and 15 hours in mathematics, including: Computer Science: CSCI 1201, 1201L, 1202, 1202L, 2111, 2163, 2215, 3102, 3155, 3160, 3166, 3650, 3651, 3688, and six semester hours of approved computer science courses numbers 3000 or above.

Mathematics: MATH 1120, 1165, 2164, STAT 1220, 1223; **or** MATH 1241, 1242, 1165, 2164, STAT 2122.

A component of related work must be included, consisting of 15 semester hours of approved non-computer science courses forming an integrated program of secondary strength, or nine semester hours of approved mathematics courses at the 3000 level or above. If the latter option is selected, six hours of additional electives must be selected.

BACHELOR OF ARTS: INFORMATION SCIENCE

The *Information Science Concentration* consists of 42 hours in computer science and 15 hours in mathematics, including:

Computer Science: 1201, 1201L, 1202, 1202L, 2111, 2112, 2170, 2215, 3106, 3130, 3155, 3160, 3166, 3650, 3651, 3688, and three semester hours of approved computer science courses numbered 3000 or above.

Mathematics: 1120, 1165, 2164, STAT 1220, 1223.

A component of related work must be included consisting of 18 semester hours of courses from the Belk College of Business Administration. These currently included: ACCT 2121, 2122; ECON 1201, 1202; and two of the following: OPER 3100, MKTG 3110, FINN 3120, MGMT 3140.

BACHELOR OF SCIENCE: COMPUTER SCIENCE

The Bachelor of Science degree in Computer Science consists of 45 hours of computer science, six hours of computer engineering, and 15 hours of mathematics courses, including:

Computer Science: 1201, 1201L, 1202, 1202L, 2123/2175, 2215, 3102, 3143, 3155, 3160, 3166, 3650, 3651, 3688, and nine hours of approved computer science or computer engineering elective courses numbered 3000 or above.

Computer Engineering: 2181 and 3182

Mathematics: 1241, 1242, 1165, 2164, STAT 2122.

Students working toward the B.S. degree must complete 14 hours of science, including Physics 2101, 2101L, 2102, and 2102L. A component of related work must be included consisting of 15 semester hours of approved non-computer science courses forming an integrated program of secondary strength, or nine semester hours of approved mathematics courses at the 3000 level or above. If the latter option is selected, six hours of additional electives must be selected.

BACHELOR OF SCIENCE: COMPUTER ENGINEERING

The *Computer Engineering Concentration* consists of 21 hours of computer science, 15 hours of computer engineering, and 18 hours of mathematics, including:

Computer Science: CSCI 1201, 1201L, 1202, 1202L, 2215, 3102, 3143, 3155, 3688; CPGR 2181, 3182, 3183, 3681, 3682.

Mathematics: MATH 1241, 1242, 1165, 2164, 2171, STAT 2122.

Students must also complete Physics 2101, 2101L, 2102, 2102L, and 3241, and Chemistry 1251 and 1251L. A component of related work must include 11 hours of Electrical Engineering courses, EEGR 2111, 2112, 2155, 2156, and 3131. Economics 1201 or 1202 must also be taken. Twelve hours of technical electives must be approved by the department.

COMPUTER SCIENCE MINOR

Requirements for the minor include completion of 18 hours of Computer Science to include CSCI 1201, 1201L 1202, 1202L, 2215, 3155, and 3685. Also required is MATH 1165.

CURRICULUM OUTLINE: B.A. DEGREE, COMPUTER SCIENCE

Freshman Year

Fall		Spring	
CSCI 1201	2	CSCI 1202	2
CSCI 1201L	1	CSCI 1202L	1
MATH 1120*	3	MATH 1165*	3
ENGL 1101	3	STAT 1220*	3
GOAL V	3	GOAL VI	3
ENGR 1201	2	ENGL 1102	3
	14		15

Sophomore Year

Fall		Spring	
CSCI 2111	3	CSCI 2215	3
CSCI 2163	3	COMM 2105	3
STAT 1223*	3	MATH 2164*	3
ENGL 2116	3	GOAL IV	4
GOAL IV	4	GOAL VI	3
	16		16

Junior Year

Fall		Spring	
CSCI 3102	3	CSCI 3155	3
GOAL IV	4	CSCI 3160	3
GOAL V	3	CSCI 3166	3
Related Work	3	Related Work	6
	13		15

Senior Year

Fall		Spring	
CSCI 3650	3	CSCI 3651	3
CSCI 3688	3	CSCI 3xxx	3
CSCI 3xxx	3	Electives	6
Related Work	3	Related Work	3
Electives	4		
	16		15

Total Hours 120

* A mathematics option consisting of MATH 1241, 1242, 1165, and 2164, and STAT 2122 may be selected as an alternate of the math courses listed. If this alternative is selected, the amount of electives decreases by two (2) hours.

CURRICULUM OUTLINE: B.A. DEGREE, INFORMATION SCIENCE CONCENTRATION

Freshman Year

Fall		Spring	
CSCI 1201	2	CSCI 1202	2
CSCI 1201L	1	CSCI 1202L	1
ENGL 1101	3	ENGL 1102	3
MATH 1120	3	MATH 1165	3
GOAL IV	4	STAT 1220	3
ENGR 1201	2	GOAL IV	4
	15		16

Sophomore Year

Fall		Spring	
CSCI 2111	3	CSCI 2112	3
CSCI 2215	3	CSCI 2170	3
STAT 1223	3	ECON 1201	3
ENGL 2116	3	MATH 2164	3
GOAL IV	4	COMM 2105	3
	16		15

Junior Year

Fall		Spring	
CSCI 3130	3	CSCI 3160	3
CSCI 3166	3	ACCT 2122	3
CSCI 3688	3	ECON 1202	3
ACCT 2121	3	GOAL VI02	3
GOAL V	3		
	15		12

Senior Year

Fall		Spring	
CSCI 3155	3	CSCI 3xxx	3
CSCI 3650	3	CSCI 3651	3
GOAL VI	3	GOAL V	3
Related Work*	3	Related Work*	3
Elective	4	Elective	3
	16		15

Total Hours 120

*Must select two from OPER 3100, MKTG 3110, FINN 3120 and MGMT 3140.

CURRICULUM OUTLINE: B.S. DEGREE IN COMPUTER SCIENCE

Freshman Year

Fall		Spring	
CSCI 1201	2	CSCI 1202	2
CSCI 1201L	1	CSCI 1202L	1
MATH 1241	3	MATH 1242	3
ENGL 1101	3	ENGL 1102	3
Science course	3	PHYS 2101	3
GOAL VI	3	PHYS 2101L	1
ENGR 1201	2		
	17		13

Sophomore Year

Fall		Spring	
CPGR 2181	3	CSCI 2123/2175	3
STAT 2122	3	CSCI 2215	3
MATH 1165	3	MATH 2164	3
ENGL 2116	3	Science Course	3
PHYS 2102	3	GOAL VI	3
PHYS 2102L	1		
	16		15

Junior Year

Fall		Spring	
CSCI 3102	3	CSCI 3688	3
CPGR 3182	3	CSCI 3155	3
CSCI Elective	3	CSCI 3166	3
GOAL V	3	Related Work	3
Related Work	3	GOAL V	3
	15		15

Senior Year

Fall		Spring	
CSCI 3650	3	CSCI 3651	3
CSCI 3160	3	CSCI 3143	3
CSCI Elective	3	CSCI 3166	3
Related Work	3	Related Work	6
Elective	2		
	14		15

Total Hours 120

CURRICULUM OUTLINE: B.S. DEGREE, COMPUTER ENGINEERING CONCENTRATION

Freshman Year

Fall		Spring	
CSCI 1201	2	CSCI 1202	2
CSCI 1201L	1	CSCI 1202L	1
MATH 1241	3	MATH 1242	3
CHEM 1251	3	PHYS 210I	3
CHEM 1251L	1	PHYS 2101L	I
ENGL 1101	3	ENGL 1102	3
ENGR 1201	2	GOAL VI	3
	15		16

Sophomore Year

Fall		Spring	
CPGR 2181	3	CSCI 2215	3
ENGL 2116	3	EEGR 2111	3
MATH I165	3	EEGR 2155	1
PHYS 2102	3	MATH 2164	3
PHYS 2102L	1	MATH 2171	3
STAT 2122	3	PHYS 3141	3
	16		15

Junior Year

Fall		Spring	
CSCI 3182	3	CSCI 3102	3
ECON 1201 or 1202	3	CSCI 3155	3
		CSCI 3688	3
EEGR 2112	3	EEGR 3131	3
EEGR 2156	1	GOAL V	3
GOAL V	3		
	13		15

Senior Year

Fall		Spring	
CSCI 3183	3	CSCI 3143	3
CPGR 3681	3	CPGR 3682	3
Tech Electives	6	Tech Electives	6
Free Electives	3	Free Electives	2
	15		14

Total Hours 120

Department of Electrical Engineering

Chairperson: Professor Tranjan; *Professors*: Bobbio, Daneshvar, Greene, Kakad, Lukic, Makki, Phillips, Tsu; *Associate Professors*: Coleman, Edwards, Feldman, Metze, Miri, Zhou; *Associate Professor Emeritus:* Smith; *Assistant Professors*: Dahlberg, Hasan, Kiamilev, Middleton, Sleva, Weldon

The Electrical Engineering Department provides instruction and research in areas of electrical and computer engineering such as electronics, microelectronics, optoelectronics, power systems, control theory, digital systems, communications and VLSI design..

The Department offers a Bachelor of Science in Electrical Engineering (B.S.E.E.) degree. A six-semester sequence of courses that are designed to develop the concepts and design and analysis techniques fundamental to the various areas of specializations forms the core of the curriculum. Emphasis is placed on the utilization of computers throughout the curriculum.

The laboratory courses are designed to: (1) teach the basic techniques of instrumentation; (2) develop skills in communications; and (3) relate the analytical methods developed in the classroom to the performance of real physical systems.

The curriculum requirements are flexible enough to enable a student to synthesize a program of study to achieve his or her particular objectives and degree of specialization. This is done through the use of the technical electives, with the guidance and approval of the student's academic adviser. If further specialization in a particular area is desired, the student is encouraged to seek an advanced degree.

Graduate studies in electronics, microelectronics, optoelectronics, computer engineering, signal processing, communications, and power and control systems are offered by the department at the master's level. The department also offers a doctoral degree with emphasis in microelectronics, optoelectronics, and computer engineering. (See the *Graduate Section* of this *Catalog*.)

The program in Electrical Engineering is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING (B.S.E.E.)

This curriculum became effective Fall 1995. Students entering the program prior to Fall 1995 should refer to a previous catalog or contact the Department office for their program of study.

A major in Electrical Engineering leading to the B.S.E.E. degree consists of a total of 125 credit hours. These requirements are:

English	6
Humanities and Social Science Electives	18
Mathematics	15
Physics	10
Chemistry	4
Science Elective	3
Engineering	4
Mechanical Engineering	3
Departmental Requirements	50
Technical Electives	9
Economics	3
	125

*Foreign language may be considered as HUM/SS.

The social science and humanities electives must include some courses at an advanced level and be chosen to satisfy Goals III, V and VI of University general education requirements and to meet the objectives of a broad education consistent with the educational goals of the profession.

The science elective must be chosen from the physical, life or earth sciences and must complement the student's overall educational plan.

The technical electives are chosen by students in consultation with their academic adviser. Students can use these electives to (1) obtain some breadth within electrical engineering by choosing additional advanced courses; (2) obtain significant depth within a particular area of electrical engineering; and (3) prepare for graduate work in electrical engineering. The technical electives must contain at least nine hours of coursework dealing with engineering science, analysis, synthesis or design. See department guidelines for selection of these courses.

All junior-level core courses must be satisfactorily completed prior to enrolling in the senior project courses.

CURRICULUM OUTLINE: B.S.E.E. DEGREE (Effective Fall 1995)

Freshman Year

Intro. To Engr. Pract. & Prin. I	2
Diff. & Integral (Cal I)	3
Principles of Chemistry	3
Chemistry Lab	1
English Composition	3
HUM/SS	3
	15

Intro. To Engr. Pract. & Prin II	2
Diff & Integral (Cal II)	3
Dynamics	3
Physics Lab	1
Composition & Literature	3
HUM/SS	3
	15

Sophomore Year

Network Theory I	3
Computer Utilization in C++	2
Switching Theory & Logic Design I	3
Electricity & Mag	3
Differential Equations	3
Lab: Logic & Networks	1
	15

Network Theory II	3
Introduction to Modern Physics	3
Diff. & Integral (Cal III)	3
HUM/SS	3
Electrical Engineering Design I	2
Lab: Instrumentation and Networks	1
	15

Junior Year

System and Signals	3
Electrical Engineering Design II	2
Fundamentals of Electronics & Semiconductors	3
Introduction to Electromagnetic Fields	3
HUM/SS	3
Professional Development	0
Lab: Systems and Electronics	1
	15

HUM/SS	3
Electromagnetic Devices/or Solid State Devices	3
Electronics	3
Electromagnetic Waves	3
Probability and Statistics	3
Professional Development	0
Lab: Electromagnetic and Electronic Devices	1
	16

Senior Year

Senior Design I	2
EEGR HXX	3
Technical Elective	3
Science Elective	3
Communication Theory	3
Economics	3
Professional Development	0
	17

Senior Design II	3
Thermodynamics	3
Technical Elective	3
Technical Elective	3
HUM/SS	3
Electrical Engineering Professional Practice	2
	17

Total Hours 125

Department of Engineering Technology

Interim Chairperson: Professor Liu; *Professors:* Byars, Patten; *Associate Professors*: Barry, Braun, Carter, Chaffin, Liou, Mobley, Priebe, Shelnutt, Wang; *Associate Professor Emeritus:* Willis; *Assistant Professors*: Bowen, Smith; *Visiting Assistant Professor*: Owen; *Adjunct Associate Professor:* van Brederode; *Lecturer (Full-time):* P. Smith; *Lecturers (Part-time)*: Mogilevskii, Ratchford, Raymond, Silver

Engineering and technical education have undergone considerable change in the last 30 years. The complexities of space exploration, nuclear power, communications systems, environmental control, information processing, transportation systems and manufacturing have demanded a great increase in the involvement of professional engineers in theoretical and analytical work. This has resulted in a much greater emphasis upon research and development, science and mathematics in professional engineering curricula. At the same time, after the more complex devices and systems have been engineered, the design, development and operation require the sophisticated knowledge and skills of what might be called the "applied engineering sciences." Programs dedicated to filling this need exist all over the United States. The aim and content of these programs are distinctly different from professional engineering curricula.

To provide the appropriate distinction from both theoretical-professional engineers and from engineering technicians who are graduated from the two-year technical institutes, the designation "engineering technologist" is being used throughout the United States for the graduates of four-year applied engineering or "engineering technology" curricula.

The two-year technical institute programs in North Carolina and in many other states provide an excellent foundation for four-year baccalaureate engineering technology curricula. Therefore, the Engineering Technology program at UNC Charlotte is limited to the junior and senior years, and an Associate in Applied Science degree is required for admission.

UNC Charlotte offers four curricula leading to a Bachelor of Science in Engineering Technology (B.S.E.T.) degree: **Civil Engineering Technology** (emphases on General Civil Engineering Technology and on Construction Engineering Technology); **Electrical Engineering Technology** (emphases on Electronics Engineering Technology and Computer Engineering Technology); **Manufacturing Engineering Technology** (emphases on General Manufacturing Engineering Technology and on Industrial Engineering Technology); and **Mechanical Engineering Technology.** The programs of study in Engineering Technology are accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology.

Under a pilot project beginning in 1997, the B.S.E.T. program will be delivered to selected community college sites using the North Carolina Information Highway (NCIH), an interactive video and audio network. Students participating in the pilot project will take most of their courses at the community college site and will attend UNC Charlotte in the summer.

BACHELOR OF SCIENCE IN ENGINEERING TECHNOLOGY (B.S.E.T.)

Requirements for Admission. A student who has graduated from a technical institute or the technical division of a junior college must meet the following requirements to enter the Engineering Technology program at UNC Charlotte:

1. An Associate in Applied Science degree in one of the following fields: Architectural, Automation, Building Construction, Civil, Construction, Computer, Controls, Design and Drafting, Electrical, Environmental, Optical, Electronics, Industrial, Instrumentation, Manufacturing, Mechanical, Robotics, or Surveying Technology;

2. An overall grade point average of at least 2.2 except for the requirement of at least 2.5 for entry into the Manufacturing Engineering Technology program (based on the 4.0 system) on all courses taken at the technical institute or community college; and

3. Satisfactory completion of the prerequisite background courses for the program emphasis which the student plans to enter.

There is considerable variance in the contents of technical institute programs throughout the United States. Should this result in entrance deficiencies, the student can usually remove these deficiencies at any technical institute or community college prior to admission to UNC Charlotte, or during the first year at UNC Charlotte.

Residence Requirements. A student must earn the last 30 semester hours of credit toward the degree and the last 12 semester hours of work in the major at this University to satisfy residence requirements.

Experiential Learning Requirements. All students graduating after August 1999 must complete at least one experiential course. Experiential courses are practice-oriented courses such as cooperative education, internships, design projects sponsored by industrial partners, or undergraduate research. This experience must be approved in advance, in writing, by the student's adviser.

Requirements for Continuance. In order to be eligible for the B.S.E.T. degree, students must attain a minimum GPA of 2.0 in: (1) all courses attempted at UNC Charlotte, and (2) all courses attempted in the William States Lee College of Engineering. A student may not accumulate more than three (3) failing grades in College of Engineering courses. If four or more course failures are accumulated, the student will be suspended from study in the Engineering Technology Department for two years. In no case may a course be repeated more than once (i.e., taken for a grade more than twice) without the Dean's approval.

Course Requirements. Prerequisite courses for entering the Engineering Technology program, normally taken at a technical institute or junior college, are listed on the pages that follow. Courses that must be completed at UNC Charlotte are listed in the Engineering Technology curricula that follow.

General Education Requirements. All students must satisfy the Goals of UNC Charlotte Education to receive the B.S.E.T. degree.

Prerequisites for admission to all of the Engineering Technology Programs. Students must have satisfactorily completed the following subjects in their two-year associate degree program:

English Composition, Technical Writing and/or Public Speaking *(9 quarter or 6 semester hours)*
Algebra, Trigonometry and Analytic Geometry with Calculus *(13 quarter or 9 semester hours)*
Differential and Integral Calculus *(5 quarter or 3 semester hours)*
General Physics (with laboratory) *(8 quarter or 4 semester hours)*
Physics or Chemistry (with laboratory) *(4 quarter or 4 semester hours)*
Humanities or Social Sciences that partially satisfy UNC Charlotte General Education Goals III, V, and VI *(6 quarter or 3 semester hours)*
Computer Programming (BASIC, FORTRAN, PASCAL, or C) *(3 quarter or 3 semester hours)*
Technical Courses in Major Area as listed below *(48 quarter hours or 32 semester hours)*

Total maximum transfer credit from two-year college is 96 quarter hours or 64 semester hours.

Discipline Specific Prerequisites:

Civil
Drafting
Surveying
Statics
Strength of Materials

Electrical
Electrical Drafting
D.C. Circuits
A.C. Circuits

Digital Circuits (6 Q.H.'s min.)
Semiconductor Circuits
Communications Electronics, Control Systems or Micro Computers

Mechanical
Drafting
Machine Processes
Statics
Strength of Materials
Metallurgy or Engineering Materials
Kinematics or Mechanisms
Design Drafting or Machine Design
Basic Electrical Circuits
(Or Physics III, Electricity)

Manufacturing and Industrial
Electrical Background
Electrical Drafting
D.C. Circuits
A.C. Circuits
Digital Circuits (6 Q.H.'s min.)
Semiconductor Circuits
Communications Electronics or Control Systems or Microcomputers

Mechanical Background
Basic Electrical Circuits or Physics III - Electricity
Statics
Strength of Materials
Machine Processes
Metallurgy or Engineering Materials
Kinematics or Mechanisms
Design Drafting or Machine Design

Computer Technology Background
Introduction to Computers/Micros
Electronics for Computers
Computer Aided Design
Industrial Computer Applications
Process Control
Micro Interfacing

Laser, Electro-Optics Background
Basic Optics
Digital/Analog Circuits
Electronic Measurements or Instrumentation
Control Systems or Communications or Computer Interfacing
Others from:
Laser Optics
Materials
Industrial Optics
Signal Processing or Technical Electives

Industrial Background
Statistics
Drafting
Production Planning
Work Measurement or Methods Analysis or Time and Motion Study
Machine Processes or Manufacturing

Manufacturing, Automation or Robotics Background
Drafting or Design
Machine/Manufacturing Processes
Metallurgy or Engineering Materials
Electrical Circuits or Electrical Measurements or Physics III - Electricity
Manufacturing, Automation or Robotics
Microprocessors or Numerical Control

Instrumentation/Controls Background
Electrical Drafting
DC/AC Circuits
Industrial Instrumentation
Controls
Digital/Analog Circuits

CIVIL ENGINEERING TECHNOLOGY PROGRAM General Civil Engineering Technology Emphasis

Junior Year

EGET	3071	Engineering Tech. Prof. Seminar	1
CIET	3111	Structural Analysis I	3
CIET	3121	Foundations and Earthwork	3
CIET	3151	Soil Testing Laboratory	1
EGET	3222	Engineering Economics	2
Directed Electives (b)			6
			16

CIET	3112	Structural Analysis II	3
CIET	3132	Hydraulics	3
EGET	3171	Engineering Analysis I	3
CIET	3150	Hydraulics & Materials Lab	1
Directed Electives (b)			6
			16

Senior Year

CIET	3212	Structural Steel Design	3
CIET	3262	Intro to Environmental Engineering	3
EGET	3272	Applied Numerical Methods	2
CHEM	1251	Principles of Chemistry or GEOL 1200 Physical Geology (both with lab) (a)	4
Directed Electives (b)			3
			15

CIET	3642	Senior Design Project	2
CIET	3211	Reinforced Concrete Design	3
CIET	3241	Highway Design & Construction	3
Major Elective (d)			3
Major Elective Lab			1
Directed Electives (b)			3
			15

CIVIL ENGINEERING TECHNOLOGY PROGRAM Construction Engineering Technology Emphasis

Junior Year

EGET	3071	Engineering Tech. Prof. Seminar	1
CIET	3111	Structural Analysis I	3
CIET	3121	Foundations & Earthwork	3
CIET	3151	Soil Testing Lab	1
Directed Elective (b)			6
EGET	3222	Engineering Economics	2
			16

CIET	3112	Structural Analysis II	3
CIET	3132	Hydraulics	3
EGET	3171	Engineering Analysis I	3
CIET	3150	Hydraulics & Materials Lab	1
Directed Electives (b)			6
			16

Senior Year

CIET	3212	Structural Steel Design	3
CIET	3243	Project Management Technology	3

CIET 3281 Cost Estimating I 3
GEOL 1200 Physical Geology with Lab 4
Directed Elective (b) 3
16

CIET 3642 Senior Design Project 2
CIET 3211 Reinforced Concrete Design 3
CIET 3293 Mech. & Elec. Systems for Building . 3
Major Elective (d) 3
Directed Electives (b) 3
14

ELECTRICAL ENGINEERING TECHNOLOGY PROGRAM
Computer Engineering Technology Emphasis

Junior Year

EGET 3071 Engineering Tech. Prof. Seminar 1
ELET 3133 Analysis of Linear Networks I 3
ELET 3153 ELET Lab I 1
EGET 3171 Engineering Analysis I 3
ELET 3183 Digital Design 3
Directed Elective (b) 3
14

CHEM 1251 Principles of Chemistry (a) 3
ELET 3124 Analysis of Linear Networks II 4
ELET 3156 ELET Laboratory II 1
ELET 3285 ssembly Language Programming 3
Directed Elective (b) 3
14

Senior Year

ELET 3211 Active Networks I 3
ELET 3255 ELET Laboratory III 1
ELET 3281 Computer Design 3
Major Elective (c) 3
Directed Electives (b) 6
16

ELET 3641 Senior Design Project 1
ELET 3212 Active Networks II 3
ELET 3275 Integrated Circuit Applications 3
ELET 3286 Microcomputer Applications 3
Directed Electives (b) 6
16

ELECTRICAL ENGINEERING TECHNOLOGY PROGRAM
Electronics Engineering Technology Emphasis

Junior Year

EGET 3071 Engineering Tech. Prof. Seminar 1
ELET 3133 Analysis of Linear Networks I 3
ELET 3153 ELET Lab I 1
ELET 3183 Digital Logic Design 3
EGET 3171 Engineering Analysis I 3
Directed Elective (b) 3
14

CHEM 1251 Principles of Chemistry 3
ELET 3124 Linear Analysis II 4
ELET 3156 ELET Lab II 1
ELET 3285 Assembly Language Program 3
Directed Elective (b) 3
14

Senior Year

ELET 3211 Active Networks I 3
ELET 3213 Industrial Electronics 3
ELET 3257 ELET Lab III 1
Major Elective (c) 3
Directed Electives (b) 6
16

ELET 3641 Senior Design Project 1
ELET 3212 Active Networks II 3
ELET 3222 Automatic Controls 3
ELET 3214 Operational Amplifiers 3
Directed Electives (b) 6
16

MANUFACTURING ENGINEERING TECHNOLOGY (Interdisciplinary)

General Manufacturing Engineering Technology Emphasis

Junior Year

ENGR 1201 Intro to Prof. Princ. & Practice 2
STAT 1220 Statistics (f) 3
MEET 3163 Instrumentation and Control 3
MFET 3111 Manufacturing Processes 3
Directed Elective (b) 3
MFET 3490 Manufacturing Eng. Tech. Practicum **or**
ENGR 3590 Engineering Co-op Education (e) 0
14

MFET 3131 Computer Integrated Manufacturing . . 3
MEET 3251 Instrumentation Lab 1
CHEM 1251 Principles of Chemistry (a) 3
EGET 3223 Engineering Economics 2
MFET 3251 Computer Integrated Manufacturing Lab 2
Directed Elective (b) 3
EGET 3695 Engineering Technology Practicum Sem 1
MFET 3490 Manufacturing Eng. Tech. Practicum **or**
ENGR 3590 Engineering Co-op Education (e) 0
15

Senior Year

MFET 3181 Digital Process Control 3
INET 3133 Quality Control 3
OPER 3100 Operations Management 3
Directed Electives (b) 6
EGET 3695 Engineering Technology Practicum Sem.1
MFET 3490 Manufacturing Eng. Tech. Practicum **or**
ENGR 3590 Engineering Co-op Education (e) 0
16

EGET 3643 Senior Design Project 3
Technical Elective (d) 3
Directed Electives (b) 9
EGET 3695 Engineering Technology Practicum Sem.1
16

Industrial Engineering Technology Emphasis

Junior Year

ENGR 1201 Intro. To Prof. Princ. & Practice . . . 2
CHEM 1251 Principles of Chemistry (a) 3
MFET 3111 Manufacturing Processes 3
EGET 3223 Engineering Economics 2
STAT 1220 Statistics (f) 3
Directed Elective (b) 3
MFET 3490 Manufacturing Eng. Tech. Practicum **or**
ENGR 3590 Engineering Co-op Education 0
16

ENGR 3670 Total Quality Systems 3
OPER 3100 Operations Management 3
INET 3103 Methods Analysis 3
Technical Electives (d) 3
Directed Elective (b) 3
EGET 3695 Engineering Technology Practicum Sem.1
MFET 3490 Manufacturing Eng. Tech. Practicum **or**
ENGR 3590 Engineering Co-op Education 0
16

Senior Year

INET 3133	Quality Control	3
INET 3123	Production Control Systems	3
Directed Electives (b)		9
EGET 3695	Engineering Technology Practicum Sem.	1
MFET 3490	Manufacturing Eng. Tech. Practicum **or**	
ENGR 3590	Engineering Co-op Education	0
		16

INET 3203	Plant Layout	3
EGET 3643	Senior Design Project	3
Technical Elective (d)		3
Directed Electives (b)		3
EGET 3695	Engineering Technology Practicum Sem.	1
		13

Recommended Manufacturing Engineering Technology Electives (where not required)

CSCI 2116	C Programming (3)
EGET 3171	Engineering Analysis (3)
EGET 3272	Applied Numerical Methods (2)
ELET 3133	Analysis of Linear Networks I (3)
ELET 3124	Analysis of Linear Networks II (4)
ELET 3153	ELET Laboratory I (1)
ELET 3183	Digital Logic Design (3)
ELET 3213	Industrial Electronics (3)
ENGR 3670	Total Quality Systems (3)
GEOG 3150	Manufacturing Geography (3)
INET 3103	Methods Analysis (3)
INET 3123	Production Control Systems (3)
INET 3203	Plant Layout (3)
INET 3233	Occupational Safety (3)
INET 3263	Human Factors (3)
MEET 3113	Dynamics (3)
MEET 3123	Strength of Materials (3)
MEET 3133	Fluid Mechanics (3)
MEET 3151	Fluid Mechanics Lab (1)
MEET 3152	Stress Analysis Lab (1)
MEET 3163	Instrumentation and Controls (3)
MEET 3213	Machine Design (3)
MEET 3251	Instrumentation Lab (1)
MFET 3113	Fundamentals of Optics (3)
MFET 3114	Thin Films & Optical Coatings (3)
MFET 3131	Computer Integrated Manufacturing (3)
MFET 3141	Applied Optical Systems Lab (1)
MFET 3141	Industrial Applied Optical Systems (3)
MFET 3153	Optics Laboratory (1)
MFET 3251	Computer Integrated Manufacturing Lab (2)
PSYC 2171	Industrial Psychology (3)

MECHANICAL ENGINEERING TECHNOLOGY

Junior Year

EGET 3071	Engineering Tech. Prof. Seminar	1
MEET 3123	Strength of Materials	3
MEET 3152	Stress Analysis Laboratory	1
MEET 3133	Fluid Mechanics	3
EGET 3171	Engineering Analysis I	3
Directed Elective (b)		3
		14

MEET 3113	Dynamics	3
MEET 3143	Thermodynamics	3
MEET 3151	Fluid Mechanics Laboratory	1
EGET 3222	Engineering Economics	2
CHEM 1251	Principles of Chemistry (a)	3
Major Elective (c)		3
		15

Senior Year

MEET 3213	Machine Design	3
MEET 3163	Instrumentation and Controls	3
MEET 3252	Thermodynamics Laboratory	1
EGET 3272	Applied Numerical Methods	2
Directed Electives(b)		6
		15

EGET 3643	Senior Design Project	3
MEET 3251	Instrumentation Laboratory	1
Major Elective (c)		3
Directed Electives		9
		16

Notes regarding Curriculum Outlines.

a. A student who has previously taken a college-level course in general chemistry shall substitute for this requirement another course in chemistry, physics, biology or earth science as shown in the table below.

Students who have previously taken:	**Shall Take at UNC Charlotte:**
3 quarters of physics and no chemistry	Chemistry 1251
2 quarters of physics and 1 quarter of chemistry	Physics 1102 with lab
3 quarters of physics and at least one quarter of chemistry (4 quarter hours)	Geology 1101 or 1200, Biology 1110, or Physics 1130

b. A directed elective is used to fulfill (1) general education goals, and (2) the Foreign Language requirement. If these two requirements have been met, directed electives revert to major electives. All elective courses are to be non-remedial. Courses passed at other institutions cannot be repeated at UNC Charlotte to meet requirements of the Department of Engineering Technology. Subjects taken at UNC Charlotte are intended to increase students' knowledge and understanding.

c. Major elective courses must be upper division courses offered by the William States Lee College of Engineering or courses related to the student's field of specialization and approved by the Department as major electives. Major elective courses are all 3000 level or above courses in the college of engineering plus, upon written approval by adviser, CSCI 2116, STAT 1220, GEOG 3150, OPER 3100, and PSYC 2171.

d. Due to the interdisciplinary nature of the program, a standard set of courses is not prescribed. Technical Electives are to be selected from a list maintained in the department office based on: the students' interests, courses already completed as part of the AAS Degree, and a plan of study developed with an Engineering Technology Department adviser.

e. The Manufacturing Engineering Technology Program includes a mandatory series of three practicum experiences. These are normally completed through the Co-op program. However, students with opportunities for appropriate work experience through their employer can meet this requirement by completing three MFET Practicum studies. Only full-time employed students who enter the program with opportunities for appropriate work experience through their employer can meet this requirement by completing three MFET 3490 practicum studies. This option must be approved by the student's adviser upon admission into the Manufacturing Engineering Technology curriculum.

f. If the student has completed a course in statistics, s/he must take EGET 3171.

Department of Mechanical Engineering and Engineering Science

Chairperson: Professor Johnson; *Bonnie E. Cone Distinguished Professor in Teaching,* Mohanty; *Norvin Kennedy Dickerson Jr. Distinguished Professor:* Hocken; *United Dominion Industries Distinguished Professor:* Patterson; *Professors:* DeHoff, Kim, Leamy, Raja, Snyder; *Associate Professors*: Estrada, Hari, Munday, Peindl, Smith; *Assistant Professors*: Cherukuri, Coger, Keanini, Wilhelm; *Lecturers*: Dubler, Hill; *Adjunct Professor*: Hanley, Kellam, Raugh, Thubrikar, Wheeler

Mechanical engineering is possibly the broadest of the engineering disciplines. Mechanical engineers are involved in almost all aspects of the technological problems facing today's society. Among the major concerns of the mechanical engineer are problems related to conversion, utilization and conservation of our limited energy resources. Additional important areas for the mechanical engineer include the design and analysis of machines, structures and manufacturing processes related to the industrial output of the nation. Increasingly this design and analysis is computer based using the techniques of computer-aided design (CAD/CAM).

A sound understanding of the engineering sciences is fundamental to the education of engineers in every discipline. The engineering sciences are generally identified as those areas of engineering which emphasize the application of the fundamental principles of the physical sciences, primarily physics and chemistry, to engineering problems. Some classical and emerging engineering areas recognized to fall within this field include thermodynamics, fluid mechanics, engineering mechanics, engineering materials, nuclear and chemical sciences, microelectronics theory and fabrication and the solid state sciences.

The Department of Mechanical Engineering and Engineering Science offers an undergraduate program leading to a Bachelor of Science in Mechanical Engineering (B.S.M.E.) degree and graduate programs leading to Master of Science in Mechanical Engineering (M.S.M.E.), Master of Science in Engineering (M.S.E.) and Doctor of Philosophy (Ph.D.) degrees. Using the flexibility provided by the technical electives, and with engineering career counseling, a student can develop a variety of educational programs which would provide the background for professional engineering licensing and practice in any of the areas included within mechanical engineering and/or the engineering sciences. The student can also prepare for graduate study in mechanical engineering, materials science or any of the recognized areas covered by the engineering sciences. Individualized study programs in one of the interdisciplinary fields involving the merger of engineering and the various science areas, such as bioengineering, microelectronics or chemical engineering sciences, can be developed.

The program in Mechanical Engineering is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET).

BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING (B.S.M.E.)

A major in Mechanical Engineering leading to the B.S.M.E. degree consists of a total of 122 credit hours. These requirements are:

English	6
Written and Oral Communication	3
Humanities and Social Science Electives	12
Economics	3
Mathematics	15
Physics	8
Chemistry	4
Science Elective	3
Engineering (Intro)	4
Engineering Science	6
Electrical Engineering	3
Departmental Requirements	46
Technical Electives	9
	122

The social science and humanities electives must be chosen to satisfy Goals III, V-A, V-L and VI-X of University general education requirements and to meet the objectives of a broad education consistent with the educational goals of the profession. This subject area must include some courses at an advanced level.

The science elective must be chosen from the physical, life or earth sciences and must complement the student's overall educational plan to satisfy the college degree requirement.

The mathematics elective may be selected from STAT 2122, MATH 2164, or a 3000-level mathematics course approved by the department.

The technical electives are chosen in consultation with the academic adviser. The student can use these electives to (1) obtain some breadth within the engineering sciences by choosing additional advanced courses from the various engineering sciences; (2) obtain significant depth within a particular area of mechanical engineering, or engineering science, through the use of available engineering science, mechanical engineering, science, mathematics and other engineering courses; and (3) prepare for graduate work in mechanical engineering, engineering science or some other engineering areas. The technical electives must contain at least three hours of coursework dealing with engineering science, analysis, synthesis or design with the remaining six hours being in engineering, science, mathematics or business.

All mechanical engineering majors must satisfactorily complete ENGR 1201 during their first semester in attendance in mechanical engineering at UNC Charlotte. Mechanical engineering majors may not accumulate more than three repeats in departmental courses in the upper division.

B.S.M.E. DEGREE IN MECHANICAL ENGINEERING

Common Freshman Year

ENGR 1201	Intro to Engineering I	2
CHEM 1251	Chemistry I	3
CHEM 1251L	Chemistry I Lab	1
MATH 1241	Calculus I	3
ENGL 1101	English I	3
HUM/SS Elective		3
		15

ENGR	1202	Intro to Engineering II	2
PHYS	2101	Physics I	3
PHYS	2101L	Physics I Lab	1
MATH	1242	Calculus II	3
ENGL	1102	English II	3
HUM/SS Elective			3
			15

Sophomore Year

PHYS	2102	Physics II	3
PHYS	2102L	Physics II Lab	1
ESGR	2141	Engr. Mechanics I	3
MATH	2241	Calculus III	3
ENGL	2116	Intro. To Technical Communications	3
HUM/SS Elective			3
			16

MEGR	2180	Manufacturing Systems	4
MEGR	2156	Design Project Lab I	2
ESGR	2144	Solid Mechanics	3
MATH	2171	Differential Equations	3
EEGR	2161	Basic Electronic Engineering	3
			15

Junior Year

MEGR	3111	Thermodynamics I	3
MEGR	3121	Dynamic Systems I	3
MEGR	3161	Engineering Materials	3
ECON 1201 or 1202 Economics			3
MEGR	3171	Measurements & Instrumentation	2
MEGR	3171L	Instrumentation Laboratory	2
			16

MEGR	3112	Thermodynamics II	3
MEGR	3122	Dynamic Systems II	3
MEGR	3116	Heat Transfer	3
MEGR	3156	Design Proj. Lab II	2
MEGR	3114	Fluid Mechanics	3
MEGR	3152	Mechanics & Materials Lab	1
			15

Senior Year

MEGR	3255	Senior Design I	2
Technical Elective			3
Math Elective			3
Science Elective			3
MEGR	3221	Machine Analysis & Design	3
MEGR	3251	Thermals/Fluids Lab	1
			15

MEGR	3256	Senior Design II	2
Technical Elective			3
Technical Elective			3
HUM/SS Elective			3
MEGR	3216	Thermal/Fluids Design	3
MEGR	3299	Professional Development	1
			15

TOTAL HOURS 122

College of Nursing and Health Professions

Dean: Professor Bishop; *Associate Deans*: Professor Carper, Hymovich

Department of Adult Health Nursing
Chairperson: Associate Professor Hussey; *Professor:* Carper, Hagopian; *Professors Emeritus:* Caddell, Jernigan, Smith; *Associate Professors*: Curran, Fray, King, Moore; *Associate Professor Emeritus:* Mayo; *Assistant Professor*: Sanders; *Lecturers*: Daniels, Groce, Smith

Department of Family and Community Nursing
Interim Chairperson: Professor Hymovich; *Professor:* Bishop; *Professor Emeritus:* Nicholson; *Associate Professors*: Boggs, Cody, Janken, Newman; *Associate Professors Emeritus:* Andrews, Clinton; *Assistant Professors*: Edwards, Hunter, Langford, Maynard, Neese, Ruth; *Lecturers:* Morris, Nishioka, Sullivan

Department of Health Promotion and Kinesiology
Chairperson: Associate Professor Lightfoot; *Professors:* Berne, Pyle; *Professors Emeritus:* Bostian, Murphy, Tillotson; *Associate Professors:* Healey, Lightfoot; *Assistant Professors:* Manning, Thompson, Wojtowicz; *Lecturers:* Avant, Barto, Debate, Fielding, Probst

Purpose. The College of Nursing and Health Professions provides professionally recognized nursing education programs, health fitness and health promotion programs, continuing education programs, outreach services, research, and professional activities to advance health care science and practice, and health promotion for the peoples of North Carolina.

Programs. Degrees awarded through the College are the Bachelor of Science in Nursing (B.S.N.), the Master of Science in Nursing (M.S.N.), the dual degree Master of Science in Nursing and Master of Health Administration (M.S.N./M.H.A.) Bachelor of Science in Health Fitness, and the Master of Education in Health Promotion. All nursing degree programs offered by the College are accredited by the National League for Nursing.

BACHELOR OF SCIENCE IN NURSING

The Bachelor of Science in Nursing degree (B.S.N.) requires a minimum of 120 semester hours. The last 30 semester hours must be earned at UNC Charlotte.

Upper Division Nursing Major

Requirements for Admission. Admission decisions to the Upper Division Nursing Major are made by the College for the Fall of each academic year. Not all applicants who meet the minimum requirements can be accommodated. Consistent with University policy, the College offers admission to applicants whose credentials present the best qualifications among those meeting minimum requirements.

Minimum criteria for application to the Nursing major are: a cumulative grade point average of 2.5 or better in all college coursework, a minimum of a *C* in all required prerequisites, and the completion of required nursing prerequisites by the end of the Spring semester prior to the Fall for which application is made.

Completed applications are accepted through January 15 of the academic year preceding the Fall for which admission is sought. Application forms are available in the Office of Student Affairs, College of Nursing and Health Professions. Admission decisions are communicated in writing by the College. Applicants who are not admitted may reapply for a future Fall term.

Prerequisites. Students are required to complete ENGL 1101; CHEM 1203 and 1204 (or CHEM 1251 and 1252); BIOL 1273, 1274, and 1259; STAT 1222 (or STAT 1220 or 1221); PSYCH 1101, and 3151; SOCY 1101 and 2132; and NURS 1100 (or an equivalent growth and development course) prior to enrollment in Level I clinical nursing courses.

Pre-Nursing. Freshmen seeking admission to the nursing major may be admitted to Pre-Nursing. Transfer and change of major students, who have not completed all prerequisites, may be admitted to Pre-Nursing. Applicants to Pre-Nursing must have a minimum overall 2.5 grade point average on all college work attempted. **Admission to Pre-Nursing does not automatically admit an applicant to the Nursing Major.**

RN/BSN Completion Program

Requirements for Admission. Registered Nurses seeking a Bachelor of Science in Nursing degree may apply for admission to the RN/BSN Program. Criteria for admission to the program are a current unencumbered license as a Registered Nurse in North Carolina, a cumulative grade point average of 2.5 or better in all college coursework, and at least a *C* in all required nursing prerequisites by the end of the semester prior to the semester for which application is made.

RN/BSN Program Prerequisites. Students are required to complete ENGL 1101; CHEM 1203 and 1204 (or CHEM 1251 and 1252); BIOL 1273, 1274, and 1259, STAT 1222 (or 1200 or 1221); PSYC 1101 and PSYC 3151; SOCY 1101 and 2132; and NURS 1100 (or an equivalent growth and development course) and the NLN Nursing Mobility Profile II prior to enrollment in Pathways courses in the major.

Pre-RN/BSN. Registered nurses seeking admission to the RN/BSN program who need to complete nursing prerequisites and/or general education courses may apply for admission to Pre-RN/BSN. Applicants must have a cumulative GPA of at least 2.5 on all college work attempted. **Admission to Pre-RN/BSN does not automatically admit an applicant to the RN/BSN Program.**

Prerequisites for Participation in Clinical Experiences

Immunization and Health Status. Prior to admission to the major, all students must submit evidence

of a physical examination, including specific communicable disease screening. The Tine test or P.P.D. must be repeated and the results submitted annually as long as the student is enrolled in clinical courses. Students must present documentation of a completed series of HBV immunizations prior to any contact with patients/clients, or sign a declination form indicating a refusal of the vaccination.

CPR Certification. For all clinical courses, it is the student's responsibility to obtain and maintain CPR Certification (adult, infant and child) for health care providers. Evidence of current CPR Certification must be submitted annually.

Requirements for Progression in the Nursing Program

In order to promote the progression of safe practitioners from one level to the next within the nursing program and eventually into the nursing profession:

1. Students must achieve a grade of *C* or better in each nursing course. In clinical courses, the student must achieve at least a *C* in the class and a satisfactory in the clinical component.
2. All Level I courses must be successfully completed (grade of *C* or better) before the student can advance to Level II clinical courses. All Level II courses must be successfully completed before the student can advance to Level III courses. A GPA of 2.0 or better must be maintained.
3. No course in the Nursing major can be taken as transient study. Transfer credit for nursing courses will be considered on an individual basis.
4. Students are **permitted to repeat a nursing course once only if space allows and may repeat a maximum of one nursing course during matriculation in the Nursing major.** Taking a challenge examination constitutes one attempt at the course. Failure of a challenge examination requires the student to enroll in the course. A student who repeats a nursing course and does not achieve at least a *C* is ineligible to continue enrollment in the College. A student dismissed from nursing under this policy has the right to use the readmission appeal process.
5. Students who do not complete successfully NURS 4090 (a given section) must repeat NURS 4090 (any section, i.e., not restricted to a repeat of the section they have failed).
6. Students are expected to be computer literate.
7. Students must achieve at least 2.0 GPA in the nursing major to graduate.

CURRICULUM OUTLINE: B.S.N. DEGREE

Freshman Year

ENGL	1101* (Goal I)	3
MATH	1100 (Goal II)	3
PSYC	1101* (Goal VI: C)	3
CHEM	1203 or 1251) (Goal IV)	4
Foreign Language** (Goal I)		3
ENGL	1102 (Goal I)	3
STAT	1220, 1221, or 1222* (Goal II)	3
CHEM	1204 or 1252* (Goal IV)	4
Foreign Language** (Goal I)		3

Sophomore Year

BIOL	1259*	4
BIOL	1273*	4
PSYC	3151*	3
SOCY	1101* (Goal III)	3
Elective (Goal I: W)		3
BIOL	1274*	4
SOCY	2132* (Goal VI: C)	3
NURS	1100* (***)	3
Elective (Goal V: L)		3
Elective (Goal V: A)		3

Junior and Senior Years:
Upper Division Nursing Major

Level I

NURS 3101	Concepts and Skills for Professional Nursing	5
NURS 3103	Pharmacology in Health and Illness	3
NURS 3104	Nutrition in Health and Illness (a)	3
NURS 3113	Health Assessment	3
NURS 3114	The Nursing Profession (a)	2

Level II

NURS 3200	Research and Theoretical Foundations of Nursing	3
NURS 3201	Nursing Care of the Childbearing Family	6
NURS 3202	Nursing Care of Children	6
NURS 3203	Nursing Care of the Adult I	6

Level III

NURS 3251	Advanced Professional Issues and Roles	3
NURS 3252	Community Health Nursing (Goal I: W) (Goal VI: X)	6
NURS 3253	Nursing Care of the Adult II	6
NURS 3254	Mental Health Nursing	6
NURS 4090	Selected Topics in Nursing	2-3

** Prerequisite to Nursing*
*** Students may need to complete one or more of these courses based on result of foreign language proficiency testing.*
**** Human Development Throughout the Life Span or any comparable course will meet this requirement.*
(a) Open to non-majors.

CURRICULUM OUTLINE: RN/BSN COMPLETION PROGRAM

*General Education Requirements and * Prerequisites for the Nursing Major*

ENGL	1101 (Goal I)*	3
MATH	1100 (Goal II)	3
PSYC	1101 (Goal VI: C)*	3
CHEM	1203 or 1251 (Goal IV)*	4
Foreign Language** (Goal I)(a)		3
STAT	1220, 1221, or 1222 (Goal II)*	3
ENGL	1102 (Goal I)	3
CHEM	1204 or 1252 (Goal IV)*	4
Foreign Language** (Goal I)(a)		3
BIOL	1259*	4
BIOL	1273*	4
PSYC	3151*	3
SOCY	1101 (Goal III)*	3
Elective (Goal I: W)		3

BIOL 1274* 4
SOCY 2132 (Goal VI: C)* 3
NURS 1100* (b) 3
Elective (Goal V: L) 3
Elective (Goal V: A) 3

RN/BSN: UPPER DIVISION NURSING MAJOR

NURN	3100	Professional Nursing Perspectives (c)	3
NURS	3200	Research and Theoretical Foundations of Nursing	3
NURS	4090	Selected Topics in Nursing (may be taken Fall or Spring)	2-3
NURS	3113	Health Assessment	3
NURN	3400	Professional Nurse Practicum/Seminar	5
NURS	4090	Selected Topics in Nursing (may be taken Fall or Spring)	3
NURS	3251	(Goal I: W)	3
NURS	3252	(Goal VI: X)	5
NURN	3401	Professional Nursing Seminar	3

(a) Students may need to complete one or more of these courses based on results of foreign language proficiency testing. Completion of these courses would require additional credit hours beyond the 120 hours.

(b) *Human Growth and Development Through the Life Span* or any comparable course will meet this requirement.

(c) Admitted students achieving a passing score on the NLN Mobility II Profile Examinations will be awarded 36 semester credit hours by examination on enrollment in NURN 3100.

Department of Health Promotion and Kinesiology

Chairperson: Associate Professor Lightfoot; *Professors:* Berne, Pyle; *Professor Emeritus:* Bostian, Murphy, Tillotson; *Associate Professors:* Healey, Lightfoot; *Assistant Professors:* Manning, Thompson, Wojtowicz; *Lecturers:* Avant, Barto, Debate, Fielding, Kohn, Probst

Health promotion is the combination of educational and environmental supports for actions and conditions of living conducive to health. Kinesiology is the study of human movement and the application of the knowledge gained to the whole range of movement supported performance, from reading and writing to throwing and balancing. Portions of the curriculum emphasize health promotion and kinesiology separately, but most aspects combine the strengths of the two disciplines. Undergraduate opportunities include a Bachelor of Science degree in Health Fitness and curricula in Athletic Training, Motor Development and Learning, and Lifetime Fitness and Sports Skills.

The **Health Fitness** major offers preparation for employment as health fitness practitioners in business and industry, health agencies, hospitals, fitness centers or any other setting which provides health enhancement programs for clients. The **Athletic Training Curriculum** enables students to prepare themselves to earn certification as athletic trainers and qualify for career opportunities in schools, colleges, medical clinics, business and industry, professional sports teams and commercial health promotion agencies. The **Perceptual Motor Learning-Motor Development Curriculum** provides knowledge and skills about the motor learning and development of children with emphasis on motor skills necessary for optimum classroom performance. Personal health enhancement opportunities are available through **Lifetime Fitness and Sports Skills** courses and the Healthy Lifestyle course.

BACHELOR OF SCIENCE

Health Fitness. Applicants who satisfy freshman or transfer requirements for admission to the University are eligible for admission to the program in Health Fitness on a space available basis. Requirements for the Health Fitness major and prerequisite courses are listed in the table on the following page.

ATHLETIC TRAINING CURRICULUM

The Athletic Training Curriculum offers a 30 hour concentration in the prevention and treatment of athletic injuries. The emphases of the curriculum are emergency medical care in the absence of medical personnel, taping techniques, recognition of injuries, and the methods and modalities of injury rehabilitation under the guidance of physicians. Students are given opportunities to gain knowledge and skills basic to passing the written and clinical exams of the National Athletic Trainers Association (NATA), and the hours supervised by certified athletic trainers and physicians in both credit and non-credit clinical apprenticeships count toward the 1,500 clinical hours required for eligibility to make the certification examinations given by NATA. Recommended courses are CHEM 1203 and 1203L; BIOL 1273, 1273L; 1274, and 1274L; PHED 2290, 2294, 3290, 3291, 3293, 3293L; and HLED 2101.

MOTOR LEARNING AND DEVELOPMENT CURRICULUM

The Motor Learning and Development curriculum offers courses in Perceptual Motor Development, Perceptual Motor Learning, Perceptual Motor Therapy, Perceptual Motor Therapy Laboratory, Movement Experiences for Elementary School Children and Special Physical Education for the Mentally Handicapped Child.

Requirements for the B.S. degree in Health Fitness

Major Courses (Hours)	Prerequisites (Hours)	Prerequisites to Prerequisites (Hours)
HLED 2101 (3) Healthy Lifestyles		
HLED 2150 (3) Introduction to Health Fitness	HLED 2101 (3) PHIL 2101 (3)	
HLED 2160 (3) Nutrition and Fitness	CHEM 1204 (3) & 1204L (1) HLED 2101 (3)	CHEM 1203 (3) & 1203L (1)
HLED 3110 (3) Health Risk Reduction for Practitioners	CSCI 1101 (3) STAT 1222 (3) HLED 2101 (3)	MATH 1100 (3) MATH 1100 (3)
HLED 3130 (3) Lifetime Weight Management	HLED 2101 (3) HLED 2160 (3) HLED 3140 (3)	 PSYC 1101 (3)
HLED 3140 (3) Behavior Change Programming in Health Fitness	PSYC 1101 (3) HLED 2101 (3) HLED 2150 (3)	
HLED 3160 (3) Health Fitness Seminar	COMM 1101 (3) COMM 2105 (3)	
HLED 3490 (12) Health Fitness Internship	Completion of all other major courses	
PHED 2280 (3) Foundations of Exercise Physiology	BIOL 1273 (3) & 1273L (1) BIOL 1274 (3) & 1274L (1)	
PHED 2290 (3) General Safety and First Aid Procedures		
PHED 3286 (3) Exercise Evaluation and Conditioning	PHED 2280 (3)	
PHED 3286L (1)	PHED 3286 (3) corequisite	
PHED 3293 (3) Biomechanics	BIOL 1273 (3) & 1273L (1) BIOL 1274 (3) & 1274L (1)	
PHED 3293L (1) Biomechanics Lab	PHED 3293 (3) corequisite	
PHED 3099 (3) Pharmacology in Health Fitness		

***Current Curriculum Requirements may be viewed at http://www.uncc.edu/colleges/nursing/hpk**

University Honors Program

Coordinator: Professor Maisto

The purpose of the University Honors curriculum is to provide intellectual excitement for students, to fill some of the gaps created through traditional disciplinary learning, to encourage concerned, globally-aware citizenship, and to provide a unique social and intellectual mix for both students and faculty. Interdisciplinary courses fit the theme, *"Issues for Human Survival in the 21st Century,"* and are designed to confront political, religious, economic, ecological, gender, race, justice, and human rights related issues and their impact on the global community and the human condition. In every case, courses include a strong humanities component with special emphasis on historical perspectives and creative literary and artistic works. The program consists of four facets:

1. A four-course sequence: HONR 1701. War, Peace, Justice and Human Survival, HONR 1702. Economic Welfare and International Communities, HONR 3701. Science, Technology and Human Values, and HONR 3702. Human Rights and Social Justice.
2. HONR 2701, Enrichment Seminar.
3. A 40 clock-hour community service laboratory: HONR 2750.
4. Senior project: HONR 3790.

Honors sections of freshman English are offered each semester and orient Freshmen to the philosophy and rigors of the Honors Program. In addition, courses across a wide variety of disciplines, including Business, Literature, and Psychology are offered to University Honors students on a demand basis and may be substituted for two of the four courses.

University Honors courses are often team taught by faculty members from different disciplines and classes have limited enrollment in order for students to develop their creative talents to the fullest extent possible. To this end, University Honors students are encouraged to live in the Honors College, a residence life facility within Poplar Hall which provides an environment conducive to study and learning. In order to facilitate learning, the "commons" area of the Honors College contains a well equipped computer room for student use and a study/classroom facility.

The Honors Program, in cooperation with Education Abroad Programs, also offers a comprehensive study abroad program, emphasizing diversity, choice, and flexibility. Opportunities vary from ten-day trips to various countries, to full academic years spent abroad, with all experiences designed to provide international education opportunities and perspectives. Some study abroad opportunities are interwoven with specially designed honors classes, while others are combined with the community service aspect of the program. Although study abroad is not required, it is strongly encouraged.

Admission. The University Honors Program is open to any student at the University who applies to the Program expressing a desire to participate in the interdisciplinary studies. In order to graduate with University Honors, students must maintain a 3.0 GPA overall and a 3.2 GPA in University Honors Courses. The Program is not recommended to students unless it is evident they are capable of and willing to maintain at least a "B" average. Additional information and details are available at the University Honors Office in Macy Hall or call 547-4824.

Departmental Honors Programs

Involvement in honors work at UNC Charlotte may take two principal forms. The University Honors Program is a broad-based program designed to give its students the more liberal education achieved through study of global interdisciplinary subjects normally falling outside traditional disciplines. Its goal is to prepare students with global awareness and concern about the issues for human survival in the 21st century. The program is a four-year sequence of study beginning with the freshman year but it can be completed in as little as two years.

Students with majors in certain departments may graduate with departmental honors. All departmental programs require research and thesis or some form of senior project. Some also require additional coursework or activity.

Honors Certification: University Requirements. To qualify for graduation with honors recognition in a specific program, a student is required to (a) have at least a 3.2 GPA for all honors courses completed in the program; (b) complete an acceptable honors thesis; (c) receive at least three hours of *A* for their honors thesis research; (d) be recommended by the program's Honors Committee for graduation with honors; and (e) complete any additional requirements specified for the program.

International Studies

Associate Vice Chancellor: Professor Josephson

The Office of International Programs offers a minor that allows undergraduate students to pursue an interdisciplinary and comparative study of foreign cultures and societies while they fulfill the academic requirements for a major in one of the approved University degree programs. Students who minor in International Studies select one of five academic tracks (African Studies, Asian Studies, European Studies, International Business, or a self-designed track focused on a particular issue, theme and/or region).

Students who minor in International Studies choose from a variety of courses and disciplines, including foreign languages, humanities, social sciences, and business. Students plan their individual programs of study with their department advisers and the Associate Vice Chancellor for International Programs. The minor is designed to provide students with cultural and intellectual enrichment for more rewarding lives in an increasingly interdependent world. The program is of particular value to those with career objectives in government, business, trade, finance, law, journalism, teaching, military service, and health. It also serves those who will seek employment with international agencies such as the United Nations and with private religious and humanitarian service organizations.

Education Abroad. Students who take advantage of the education abroad opportunities provided by the Office of International Programs may apply their overseas study credits to the minor, or where appropriate, to their major.

INTERNATIONAL STUDIES MINOR

A minor in International Studies requires completion of 26 semester hours with a GPA of 2.5 or better as outlined below:

Core courses. 6 hours of introductory coursework selected from:

GEOG	1101	World Regional Geography (3)
POLS	1150	Introduction to International Politics (3)
HIST	1100	The World in the 20th Century (3)
ANTH	1101	General Anthropology (3)

Foreign Languages. 8 semester hours of foreign language at the 2201 and 2202 level in a language related to the area track selected. If 2201 and 2202 courses are not available in the language, 1201 and 1202 in a second appropriate language may be presented. (See description of area tracks for appropriate foreign languages.)

Area Track. 12 semester hours of coursework appropriate to one of the tracks listed below. All courses must be chosen outside the student's major and from at least 2 departments. Some courses which may be appropriate for a selected area track may not be listed below. Students may take non-listed courses with the permission of an International Studies Minor adviser. The tracks and their requirements are:

African Studies. *Language*. Students pursuing the International Studies Minor with a concentration in African Studies are encouraged to choose French to fulfill the language requirement. *Courses*:

AAAS	2205	African Culture I (or ANTH 2111)
AAAS	2206	African Literature, Music and Art
AAAS	2207	Introduction to Pan Africanism
AAAS	2221	Introduction to Contemporary Africa (or HIST 2211)
AAAS	3265	African Economic Development
AAAS	4103	Warfare, the Military, and Civil Wars in Africa
ANTH	2111	Peoples of Africa (or AAAS 2205)
ENGL	4155	Pan-African Literature
HIST	2210	Pre-Colonial Africa
HIST	2211	Modern Africa (or AAAS 2221)
POLS	3143	African Politics

Asian Studies. *Language*. Students pursuing the International Studies Minor with a concentration in Asian Studies are required to take either four semesters of Japanese or Chinese (through level 2202 or equivalent).

Courses:

HIST	2200	Asian Civilization
HIST	2201	History of Modern Asia
HIST	3165	History of Modern Japan
POLS	3148	Chinese Politics
POLS	3149	Japanese Politics
POLS	3165	East Asia in World Affairs
POLS	3167	The United States and Japan
RELS	2102	Introduction to Asian Religions
RELS	3154	Hinduism
RELS	3157	Buddhism
RELS	3163	Religious Art and Architecture of India
RELS	3166	Taoism
RELS	3169	Zen Buddhism
RELS	3172	Religion in Asian Literature

European Studies. *Language*. Students pursuing the International Studies Minor with a concentration in European Studies are required to take four semesters of French, German, Russian, or Spanish (through level 2202 or equivalent). If only two semesters of Russian are available, the second year should consist of two semesters of another European language. *Courses*:

ECON	3133	Economic History of Europe
ENGL	3128	British Literature since WW I
ENGL	4123	The Modern British Novel
ENGL	4124	Modern Irish Literature
ENGL	4152	Modern European Literature
FORL	3160	European Cinema
FREN	3203	Introduction to French Literature
FREN	3209	France Today
FREN	4202	Survey of French Literature II
GERM	3050	Studies in German Literature
GERM	4204	Survey of German Literature II
HIST	2261	Britain since 1688
HIST	2271	France, 1815 to the Present
HIST	2281	Twentieth Century Germany
HIST	3116	Twentieth Century Europe
HIST	3134	European Intellectual History since 1789
HIST	2252	Russian History 1917 - Present
POLS	3141	European Politics
SPAN	3203	Introduction to Spanish Literature
SPAN	3209	Spanish Civilization and Culture
SPAN	4202	Twentieth Century Spanish Literature

International Business. *Language*. Students pursuing the International Studies Minor with a concentration in International Business are required to take either four semesters (or the equivalent) of a single foreign language or two semesters (or the equivalent) of two foreign languages. Students are encouraged to take commercial or business language courses where these are available. *Courses*.

At least 9 semester hours must be selected from the following courses:

FINN	3223	International Financial Management
MGMT	3274	International Business Processes and Problems
MKTG	3215	International Marketing Management
ACCT	3150	International Accounting
MKTG	3218	Export Marketing and Logistics
ECON	3171	International Economics for Non-Majors

Three semester hours may be selected from the list above or the following courses:

AAAS	3265	African Economic Development
ANTH	4120	Intercultural Communications
POLS	3151	International Political Economy

NOTE: Enrollment in courses offered by The Belk College of Business Administration is subject to all class standing and prerequisite requirements of the College. These requirements may be waived or modified by permission of the Coordinator of the International Business Program or by the chairperson of the department offering the course.

Self-designed Track. Students who choose to focus their study around a particular issue, theme, or region not covered by the other area tracks may do so with the advice and consent of an International Studies faculty adviser. Working together they will design a program of study and select an appropriate foreign language. Students seeking to self-design a track must see an adviser prior to declaring the minor.

EDUCATION ABROAD PROGRAMS

UNC Charlotte encourages its students to study or have an educational work experience in a foreign country as a part of their undergraduate careers. Education Abroad Programs offers opportunities to study or work abroad for a year, a semester or a summer. Programs are available in countries virtually all over the world. A semester or year abroad need not cost much more than a semester or year at UNC Charlotte. Students may receive academic credit for all courses taken while overseas and intern or coop credit for educational work experiences abroad. No time need be lost toward graduating on schedule. Study abroad may satisfy up to six semester hours of GOAL VI (X) of the general education requirements. Knowledge of a foreign language is not required to study or work abroad. UNC Charlotte has sent students in architecture, business, arts and sciences, engineering, education and nursing on its education abroad programs.

Students are encouraged to begin planning for study or work abroad while they are freshmen or sophomores. The study abroad experience may take place during the sophomore, junior, or senior year. Regular UNC Charlotte financial aid is often applicable to study abroad.

Education Abroad Programs assists students in choosing and applying for education abroad programs. It also provides cross-cultural orientation and re-entry (to the United States) assistance.

INTERNATIONAL STUDENT EXCHANGE PROGRAM (ISEP)

UNC Charlotte is one of approximately 200 U.S. institutions of higher education which are members of the International Student Exchange Program (ISEP). This program allows the UNC Charlotte student to exchange with students from Africa, Asia, Australia, Canada, Europe and Latin America. The students pay their regular tuition, fees, room and board at UNC Charlotte and exchange places for the year with students from institutions outside the United States who have similarly covered their costs. The student is registered at the foreign institution, taking the same courses, having the same assignments and participating in the same activities as all other students at that institution. This program permits the student to be exposed daily to a different set of cultural values, to new ideas and new world views. ISEP exchanges are small in scale, with only a few students going to each foreign institution.

Further information about the Education Abroad or International Student Exchange programs may be obtained from the Office of Education Abroad Programs.

ENGLISH LANGUAGE TRAINING INSTITUTE

The English Language Training Institute (ELTI) provides intensive English as a Second Language instruction for international students planning to attend American universities or colleges and for individuals pursuing professional training in the United States. ELTI holds three sessions per year--fall, spring, and summer--and offers eight language proficiency levels, including a level for applicants for graduate study. Average class size is 12 and students attend classes 20-24 hours per week. Exceptional students in Levels 6 and 7 are eligible to take University courses in addition to their English classes. ELTI also offers a communications course for international teaching assistants, consulting for international faculty at UNC Charlotte, short-term programs with English language and American culture themes, and curricula custom-designed for professional groups. For more information about the ELTI, contact the Program Director in the Office of International Programs.

ROTC Programs

To prepare themselves to serve as commissioned officers in the Air Force or Army, students may participate in the Air Force Reserve Officers' Training Corps (ROTC) offered by the Department of Aerospace Studies or in the Army Reserve Officers' Training Corps (ROTC) offered by the Military Science Area.

Aerospace Studies

Chairman: *Professor (Mil.)*: Charters; *Assistant Professors (Mil.)*: Lowdermilk, Jones

Aerospace Studies prepares students for leadership positions with the United States Air Force through the **Preprofessional Program** and offers courses to all students through the **Academic Program**. The curriculum examines multi-disciplinary issues as they relate to leadership participation in the military environment.

ACADEMIC PROGRAM

The academic program (without affiliation with the formal Air Force ROTC program) is designed for students interested in gaining a perspective on military leadership, management, ethics, and discipline. Students who pursue this concentration should take the upper-level (AERO 3100 and 3200) courses, several of which are approved to satisfy general education requirements and they may attend the lower-level courses. Participation in Leadership Laboratory courses is available by special permission from the department.

Preprofessional Program/Air Force ROTC Program. The preprofessional track of the Aerospace Studies program is implemented as the Air Force Reserve Officer Training Corps. It provides three programs for students to qualify for a commission as a second lieutenant in the Air Force. To be eligible for the Air Force ROTC preprofessional program, a student must be a citizen of the United States, physically qualified for commission in the Air Force, not under 14 years of age and, upon graduation, no more than 30 years of age. For those with

prior military service, commissioning must occur not later than age 35. If designated for flight training, the student must be able to complete all commissioning requirements prior to age 26½.

Cadets must pursue work leading to at least a bachelor's degree and be willing to sign a formal agreement at the beginning of the advanced course or upon initiation of a college scholarship. The agreement, an enlistment into the Air Force Reserve, obligates the student to remain in the ROTC program, accept a commission and serve the required period in the Air Force upon graduation. Cadets must also demonstrate proficiency or successfully complete courses in mathematical reasoning and English composition before commissioning.

Four-Year Program. This program begins with the General Military Course (GMC) and offers coursework within the lower division. GMC students not on Air Force ROTC scholarship incur no military obligation. Each candidate for commissioning must pass each GMC course with a grade of *C* or better and pass the requisite lab. Students must score appropriately on an Air Force aptitude test, pass a medical examination and be selected by a board of Air Force officers. If selected, the student then enrolls in the Professional Officer Course (POC), the last two years of the Air Force ROTC curriculum. Students attend a four-week field training course at an Air Force base normally between the sophomore and junior years. All students in the POC receive a tax-free stipend of $150 a month. Upon successful completion of the POC and the requirements for a degree, the student is commissioned in the Air Force as a second lieutenant.

Two-Year Program. The basic requirement for entry into the two-year program is that the student has two academic years of college work remaining, either at the undergraduate or graduate level, or a combination of both. Applicants seeking enrollment in the two-year program must pass Air Force aptitude and medical examinations and be selected by a board of Air Force officers. After successfully completing a six-week field training course at an Air Force base, the applicant may enroll in the Professional Officer Course (POC). Upon completion of the POC and the college requirements for a degree, the student is commissioned as a second lieutenant. All students in the two-year program receive a tax-free stipend of $150 a month.

One-Year Program. This program is designed for students in selected majors who are completing their junior year. The designated majors are announced annually. Cadets in the one-year program complete the Professional Officer Corps (POC) in approximately 15 months, which includes a 6-week field training encampment. Students attend encampment prior to entering the program. Students receive Air Force ROTC scholarship benefits of tuition, payments of fees and books, and a tax-free stipend of $150 per month.

SCHOLARSHIP PROGRAMS

Air Force ROTC awards scholarships at the freshman, sophomore and junior levels. They are only provided for the preprofessional track leading to a commission in the Air Force. They are available to qualified cadets in the one-year, two-year and four-year programs. Scholarships are given on a semester basis.

Full-time enrollment in the University or a consortium institution and the Aerospace Studies program is a requirement for scholarship eligibility. Scholarships cover full tuition, fees and books. Scholarship cadets also receive a tax-free stipend of $150 a month.

Air Force ROTC students who accept a scholarship must agree to successfully complete at least one semester of college instruction or the equivalent in a major Indo-European or Asian language before commissioning. Scholarship recipients also are required to successfully complete an English composition course prior to entry into the junior year.

Four-year scholarships also are available to high school students. High school students interested in making application should contact the Unit Recruiting Officer within the department. Initial four-year scholarship packages must be postmarked by December 1 prior to enrollment.

ADJUNCT PROGRAMS

Field Training. Two Field Training courses are offered, either of which is normally completed during the summer between the sophomore and junior years. One covers a four-week period for students in the four-year program; the other lasts six weeks and is designed for two-year program applicants. Transportation, lodging, meals and approximately $150 per week are provided by the Air Force during Field Training.

Leadership Laboratory. Those students pursuing the preprofessional track will participate a minimum of one hour per week during every semester of enrollment. The objective is to provide a laboratory environment where each student receives an opportunity to learn and develop leadership and management abilities. Cadets plan, organize and carry out the entire cadet program with only minimal guidance from the staff advisers.

Professional Development Program. Students enrolled in the junior and senior years of Air Force ROTC may volunteer to attend a two- or three-week orientation program at an Air Force base. This is an opportunity to observe and experience the working environment of an active Air Force facility and to obtain specific career information. Transportation, lodging, meals, and approximately $200 per week are provided by the Air Force during participation in this voluntary program.

Flight Screening. Cadets designated to enter Air Force Undergraduate Pilot Training after graduation participate in the Flight Screening Program between their junior and senior years unless they already have a private pilot's license. Each cadet receives 14 hours of instruction taught by Air Force personnel at no expense to the student. This training also includes ground school instruction.

Military Science Area (ROTC)

Professor (Mil.): Colcord; *Assistant Professor (Mil.):* Tilque

Participation in Army ROTC enhances the education of both men and women by providing unique leadership and management training, along with practical experience in these areas. It helps students develop many of the qualities basic to success in the Army, or in civilian careers.

Students earn a college degree and an officer's commission at the same time. The program is designed to complement the student's major area of study; participation in Army ROTC is compatible with all major areas of study. The Basic Course and the Advanced Course comprise the Military Science curriculum.

BASIC COURSE

The Basic Course is usually taken during the freshman and sophomore years. It is open to all students and incurs no military obligation. Topics include management principles, leadership development, national defense organization, land navigation, small unit tactics, survival techniques, military courtesy, and physical training. Uniforms and textbooks are provided at no cost to students. Students unable to attend the Basic Course may still qualify for the Advanced Course by attending a paid six-week summer camp following their sophomore year. Placement credit is also available for veterans, members of the reserve components, and Junior ROTC participants.

ADVANCED COURSE

The Advanced Course provides instruction in military history, advanced tactics, techniques of effective leadership, and military ethics and professionalism. It is normally taken during the junior and senior years. Students successfully completing the Basic Course, who have demonstrated the potential to become officers and meet Army physical and academic standards, are eligible to enroll in the Advanced Course. Students receive a tax-free stipend of $150 per academic month and are required to attend a paid six-week summer camp at Fort Bragg, NC, between their junior and senior years. In addition to Military Science courses, students must complete HIST 2120 American Military History. Nursing students may enter the Advanced Course without Basic Course credit.

Nursing Summer Camp. Nursing students enrolled in the Advanced Course attend a two-part summer camp between the junior and senior years. This consists of three weeks of basic military and leadership skills training at Fort Bragg, followed by three weeks of practical nursing training. The nurse intern training may be at Fort Bragg or another major Army Medical Center nationwide.

SCHOLARSHIP PROGRAM

Two- and three-year scholarships are awarded on a competitive basis, providing full tuition and educational fees, a specified amount for books and supplies, and a tax-free stipend of $150 per academic month. Students do not have to be enrolled in Army ROTC to apply and incur no obligation by applying. Application timeframe is December to February each year. Special consideration is given to students in nursing, engineering and physical sciences. Four-year scholarships are available to students who apply while in high school or prior to enrollment.

COMMISSION REQUIREMENTS

To obtain a commission in the Army, Army National Guard or Army Reserve, a student must successfully complete the Advanced Course, be recommended by the Professor of Military Science, and complete work leading to at least a baccalaureate degree.

Experiential Learning Programs

Opportunities are available for both undergraduate and graduate students to receive course credit or other recognition for supervised experiences in public and private agencies within the community, nationally, and internationally. These opportunities are offered through experiential learning programs including over 175 courses involving clinicals, cooperative education, internships, and practica. The University Career Center coordinates most experiential learning opportunities for the campus and can provide information about the following options:

Cooperative Education: This career related professional program is available to students in the Colleges of Arts and Sciences, Business Administration, and Engineering. Participants must have a GPA of at least 2.5 and complete eourse requirements specified by their department. Transfer students must complete 12 hours at UNC Charlotte before applying to the program. Co-op students work two to three semesters either part-time or full-time (depending on college requirements) with an employer in a paid work experience. Although the experience does not offer academic credit, participants are classified as full-time students. Approximately 60% of all co-op students are offered full-time employment by their co-op sponsors upon graduation.

Internships: Internship programs provide an introduction to career options in a professionally related work experience. This experience is usually unpaid and may offer academic credit if there is appropriate faculty supervision. Students work between 8 to 12 hours a week while also taking other classes. The University Career Center coordinates a formal summer internship program for the College of Arts & Sciences.

The 49ership Program: The University Career Center sponsors a non-credit internship called a 49ership. Students may apply for the program after their freshman year provided they have a GPA of 2.0 or better; graduate students must complete 9 credit hours in their graduate program before making application. (Transfer students must successfully complete 12 credit hours at UNC Charlotte before making application.) Participating employers have included Carolinas Medical Center, the District Attorney's Office, General Electric, The Mint Museum, Paramount's Carowinds, Sea-Land Services, Transamerica, US Airways, WBTV, and Zapata Engineering. Some positions in this program are compensated. The University Career Center and the Experiential Learning Council are developing one week shadowing experiences called a Career Prospector.

Preparation for Professional Schools

Students may begin preparation at UNC Charlotte for a number of professional careers. Depending upon the professional school's requirements, the student may wish to take a degree at UNC Charlotte or to transfer after one, two or three years.

Preparation for the following programs is offered: chemical engineering, dentistry, forest resources, law, medical technology, medicine, optometry, pharmacy, and veterinary medicine.

The student who plans to enter a professional school is advised to plan his/her program so that general requirements for the bachelor of arts or bachelor of science degree are met in addition to the requirements for the professional program being considered. The student planning to attend a professional school should inform his/her adviser of his/her plans. The student should become familiar with the requirements of the school which he/she plans to attend.

Chemical Engineering. Students seeking a program in chemical engineering should consult the Department of Chemistry for advice concerning available options. However, those students desiring to obtain the Bachelor of Science in Chemical Engineering degree may do so by transferring to North Carolina State University after spending two years at UNC Charlotte. To be eligible for such transfer, the student must meet the admissions requirements for transfer at North Carolina State University. After transfer, an additional two years normally will be required for the degree.

The following courses are ones which most closely resemble courses suggested for chemical engineering students at North Carolina State University.

First Year

Chemistry 1251, 1251L, 1252, 1252L (or 1253L) formerly CHEM 1101, 1101L, 1102, 1102L (or 1106L)
Engineering 1100
English 1101 and 1102
Mathematics 1241, 1242
Physics 2101,2101L
Mechanical Engineering 1102
Physical Education (two semesters)
* Elective (one semester)

Second Year

Chemistry 2131, 2131L, 2132, 2132L
Electrical Engineering 2161, 2162
Mathematics 2171, 2241
Physical Education (two semesters)
Physics 2102, 2102L
* Electives (two semesters)

**A one-semester course in each of the following areas is required before graduation from North Carolina State University: economics, English literature, history, or philosophy of science.*

Dentistry and Medicine. The composite requirements for entrance to most medical and dental schools in North Carolina, South Carolina, Georgia, Tennessee and Virginia are as follows:

Biology	8 hours
General Chemistry	8 hours
Organic Chemistry	8 hours
(Some schools require additional chemistry)	
Physics	8 hours
English	6 hours

Students should check specific requirements of schools of interest.

Pre-Medical, Preprofessional Committee. The UNC Charlotte Preprofessional Committee consists of faculty members from throughout the University and serves as the main advisory and recommending body for UNC Charlotte students seeking entrance to health professional careers. In order to obtain a recommendation to medical school or dental school from the committee, the student must register with the committee in the Biology office by September of the year in which applications are being made.

Contact the Office of Academic Affairs for the name of the committee chairperson. Students working toward entrance to health professional schools are advised to work closely with the Premedical Advisers in the Biology and Chemistry Departments throughout their study at UNC Charlotte.

Allied Health Club. Students interested in health related careers are encouraged to join the Allied Health Club. The organization sponsors speakers, volunteer opportunities in local hospitals, and trips to see admissions officers and teaching programs in schools throughout the region.

Law. The University suggests that the student planning to enter law school consider courses in such areas as accounting, business administration, business law, communications, criminal justice, debating, economics, English literature and composition, finance, history, logic and ethics, mathematics, modern languages, philosophy, political science, psychology and sociology. Preparation should include comprehension of and expression in words, the development of a critical understanding of human institutions and values and the generation of creative power in thinking. Thus, any of a number of majors, with wisely selected electives, might provide the broad educational background needed.

Pre-Law Society. The UNCC Pre-Law Society is a student pre-law organization. The Society carries on a large number of activities designed to help its members decide whether they wish to attend law school: providing sessions with pre-law advisers and attorneys; taking field trips to pre-law conferences, law schools, law offices and courts; having a guest speaker program on legal and judicial topics, and working on preparations for the LSAT. Membership in the Society is open to all UNCC students, regardless of major or year at the University. For more information, contact the Department of Political Science.

Medical Technology. The University, through affiliation with several schools of medical technology, offers programs leading to baccalaureate degrees in biology and chemistry, with training in medical technology. Students interested in this four-year program are advised to check the more detailed listing under the individual departments and to consult with the appropriate adviser in the Department of Biology or Chemistry.

Optometry. There are no schools of optometry in North Carolina. Each year, however, the State of North Carolina contracts 24 spaces in out-of-state schools of optometry and partially subsidizes the tuition costs for the students that it selects to attend these schools. Information

on these contract programs in Optometry may be obtained from General Administration of The University of North Carolina.

For admission, the contract schools require programs similar to the one given here, consisting of at least 90 semester hours of coursework. *Science courses should include appropriate laboratories:*

English 1101 and 1102
Mathematics 1103, 1241, 1242, Statistics 1121
Biology 1110 and 1115 or 1233 and 2111, 1259 or 4250, 3273, 4293
Chemistry 1251 and 1252 (formerly CHEM 1101 and 1102), 2131 and 2132
Physics 1101 and 1102
Psychology 1101
Social Science: 2 courses

Advising for students interested in pre-optometry preparation is available in the Departments of Biology, Chemistry and Physics.

Pharmacy. Students planning to seek a Bachelor of Science in Pharmacy degree may spend either one or two years at UNC Charlotte. One year is recommended for students transferring to a four-year pharmacy school; two years are recommended for students transferring to a three-year pharmacy school such as The University of North Carolina at Chapel Hill.

The following courses are equivalent to those required for transfer into the pharmacy school at UNC-Chapel Hill:

English 1101 and 1102
Mathematics 1241, 1103 (if taken before 1241)
Foreign Language: through 2201
Biology 1110 or 1233, and 1273+L, 1274+L
Chemistry 1251+L, 1252+L (formerly CHEM 1101+L, 1102+L), 2131+L, 2132+L
Physics 1101 and 1102

Students must select one course from each of the following groups for a total of four courses:

Group 1: English 2101, 2102, 2104, 2111, 2112; Theatre 1101; Music 1132
Group 2: Religion 1101; Philosophy 2101
Group 3: Economics 1201
Group 4: History 1120, 3101, 3102

Physical Education: Two semesters of physical education activities are required.

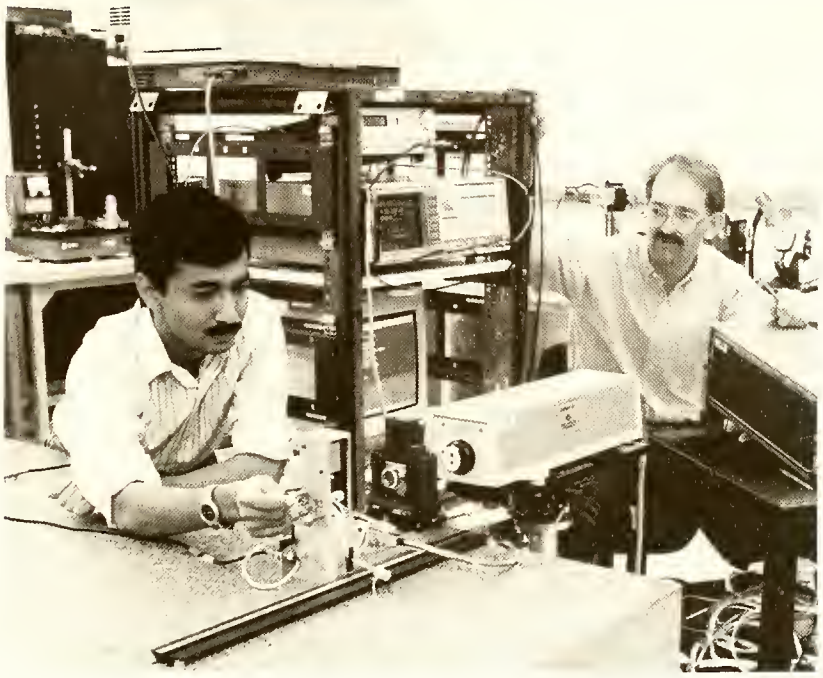
Veterinary Medicine. The following UNC Charlotte courses meet the requirements for admission to the School of Veterinary Medicine at North Carolina State University.

Students should consult with a Pre-Vet Adviser in the Biology or Chemistry Department.

ENGL 1101, 1102 6
MATH 1103, 1120 or 1241 6
STAT 1221 3
PHYS 1101+L, 1102+L 8
*BIOL 3166+L, 4250+L, Prerequisites + ... 8
CHEM 1251+L, 1252+L (formerly 1101+L, 1102+L), 2131+L, 2132+L, 4165+L 20
NURS 3104 3

All but two of these courses must be completed by the end of the Fall Semester in which a student applies for admission to the School of Veterinary Medicine.

*Non-biology majors should consult a Pre-Vet Adviser in the Biology or Chemistry Department for information on the introductory biology courses required.



THE GRADUATE SCHOOL

Administration

Robert J. Mundt, *Interim Associate Vice Chancellor for Graduate Programs and Dean of the Graduate School*

College of Architecture: Charles C. Hight, *Dean*
College of Arts and Sciences: Schley R. Lyons, *Dean*
Belk College of Business Administration: Edward M. Mazze, *Dean*
College of Education: John M. Nagle, *Dean*
The William States Lee College of Engineering: Robert D. Snyder, *Dean*
College of Nursing and Health Professions: Sue M. Bishop, *Dean*

The Graduate Council 1996-1997

Kent Curran *(Management), Chair of the Graduate Council*
Robert J. Mundt, *Interim Associate Vice Chancellor for Graduate Programs and Dean of the Graduate School*
Raymond Frankle, *Associate Vice Chancellor for Library and Information Services*
Robin Dorfer, Graduate Student Association (GSA) Representative
David Hirschel, Criminal Justice
Gerald Ingalls, Geography and Earth Sciences
Corey Lock, Middle, Secondary, and K-12 Education
Rafic Makki, Electrical Engineering
Timothy Mead, Political Science
Linda Moore, Adult Health Nursing
David Walters, Architecture

HISTORY AND ORGANIZATION

The University of North Carolina at Charlotte was established in 1965 by the North Carolina General Assembly which transformed Charlotte College, with beginnings in 1946, into a campus of The University of North Carolina. The Graduate School was established in 1985 with the appointment of the first Dean of the Graduate School, although graduate degree programs had been offered since 1969. Today more than 500 members of the Graduate Faculty and more than 2,600 graduate students participate in a broad array of graduate programs at the master's and doctoral levels and in graduate certificate programs.

The executive and administrative affairs of the Graduate School are carried out by the Associate Vice Chancellor for Graduate Programs and Dean of the Graduate School, who acts in cooperation with the deans of the six colleges of Architecture, Arts and Sciences, Business Administration, Education, Engineering, and Nursing and Health Professions.

The Graduate Council, whose voting members are elected by the faculty, reviews, develops and makes recommendations concerning Graduate School policy. All curricular proposals and all criteria for membership on the Graduate Faculty come before the Graduate Council, which also creates appropriate committees and hears grievances. In addition, the Graduate Council serves in an advisory capacity to the Dean of the Graduate School.

The Graduate Faculty. In accordance with criteria developed by each graduate program or unit and approved by the Graduate Council, the Dean of the Graduate School appoints members of the Graduate Faculty for renewable terms. Members of the Graduate Faculty offer courses and seminars, mentor graduate students, and supervise research at an advanced level of scholarship.

The Charlotte Graduate Center is a unit of the Graduate School administered by the Associate Vice Chancellor for Graduate Programs and Dean of the Graduate School. It operates under the policies established by the Graduate Faculty of UNC Charlotte. Its purpose is to employ the full range of resources for advanced study within The University of North Carolina to meet the needs and interests of students located within the Charlotte metropolitan area. The interinstitutional master's and doctoral programs complement the graduate programs offered by UNC Charlotte.

UNIVERSITY FACILITIES AND SERVICES

UNC Charlotte, the fourth largest university in the UNC system, offers a full range of facilities and services to accommodate the needs of both its students and the citizens of the Charlotte metropolitan region. The University also serves industrial development in North Carolina as one of five university members of MCNC, a research, computer and communications enterprise. These facilities and services are described in the "Campus Facilities and Services" section of this *Catalog*.

FINANCIAL ASSISTANCE

Detailed information regarding tuition, fees, financial aid, and other related topics may be found in this *Catalog* in the section on *Financial Information*. For graduate students, financial assistance programs consist of grants, loans, employment opportunities and graduate assistantships.

Grants. Scholarships are available to North Carolina residents to assist with tuition and fees and are funded through the State Appropriated Grant program and the Minority Presence Grant program. A limited number of grants to fund the difference between out-of-state and in-state tuition are available for students of high merit who have also received a graduate assistantship. Students should contact their graduate coordinator about application procedures.

North Carolina Graduate Grant. There are a limited number of tuition scholarships available for North Carolina residents.

North Carolina Minority Presence Grant Program. Under the University of North Carolina Board of Governors general Minority Presence Grant Program, Part I provides for grants to white students at predominately black institutions and to black students at predominately white institutions who are residents of North Carolina, are enrolled for at least three hours of degree credit coursework, and demonstrate financial need; Part II provides funds for grants to Native Americans and other minority students at the constituent institutions of the University of North Carolina who are residents of North Carolina, are enrolled for at least three hours of degree credit coursework, and have demonstrated financial need.

Non-Resident Tuition Differential Grant. These are available only in selected graduate programs. To be eligible, students cannot be a resident of North Carolina, must be admitted to full-standing in a graduate program, and must hold an assistantship.

Loans. Low interest loans are available through the Federal Perkins Loan and the William D. Ford Federal Direct Loan. To apply for these loans, students should complete the Free Application for Federal Student Aid (available from the Office of Student Financial Aid) before the established priority date of April 1 preceding the school year.

Employment Opportunities. The Office of Student Employment assists students in locating work on campus. The Uniersity participates in the Federal Work-Study Program and attempts to match students with jobs related to their academic interests. To apply for the Federal Work-Study Program, students should complete the Free Application for Federal Student Aid (available from the Office of Student Financial Aid) before the established priority date of April 1 preceding the school year. The University Career Center assists students in locating part-time and summer employment work off campus.

Graduate Assistantships. Approximately one-half of the University's full-time graduate students hold graduate assistantships which provide them with financial aid and valuable experience in administration, teaching, and research related to their academic endeavors. Stipends for graduate teaching assistantships range from a low of $5,000 per academic year for graduate students who assist faculty members with activities such as grading papers to a high of $12,000 per academic year for doctoral students who are responsible for teaching independent sections of courses. Stipends for graduate research assistantships range from $6,000 to $18,000 per academic year. Stipends for administrative assistantships range from $6,000 to $7,500 per academic year.

To be eligible for an assistantship, a student must be admitted to full-standing in a graduate program and must have an undergraduate GPA of at least 2.75 with a 3.0 or better for the junior and senior years or must have completed at least six hours of graduate work with a GPA of 3.0 or better.

To retain their appointment, graduate assistants must maintain appropriate enrollment, register for at least 6 graduate-level hours each semester, make satisfactory progress toward their degrees, maintain a 3.0 GPA and perform their assigned duties satisfactorily. It is expected that graduate assistants will not engage in other employment during the term of their assistantship.

Assistantships are available in most graduate degree programs and through some administrative offices. To apply, students should complete the Application for Graduate Assistantship (available from the Graduate School) and submit it to the degree program or administrative office in the winter preceding the academic year for which the assistantship is sought.

Admission to the Graduate School

The University considers all applications without regard to race, color, sex, sexual orientation, national origin, disability, age or religion. The University reserves the right to withhold the admission of an applicant who fails to meet any of the requirements for admission. In addition, it reserves the right to restrict enrollments when necessary because of budgetary or other constraints. Meeting the minimum admissions requirements does not guarantee admission to a graduate program. Applications for admission should be submitted and completed as early as possible and no later than any published deadlines. In some programs, the vacancies will be filled several weeks prior to those deadlines.

In most programs applicants for admission are reviewed as soon as the required credentials are received. All relevant factors are considered, with major emphasis being placed on the academic history of the applicant. The intent of the University is to offer admission to those applicants whose credentials indicate a strong likelihood for success in their selected curricula.

Evidence of good physical and mental health is required prior to registration. A medical report form is sent to successful applicants along with the notice of admission. State law requires all students entering a college in the State of North Carolina to meet immunization requirements described elsewhere in this *Catalog*. A family physician or the Health Department must verify that the student has had necessary immunizations.

For application forms and information, address inquiries to:

Graduate Admissions
UNC Charlotte
332 Kennedy
9201 University City Blvd.
Charlotte, NC 28223-0001

International applicants should address inquiries to:

Office of International Admissions
UNC Charlotte
9201 University City Blvd.
Charlotte, NC 28223-0001

Application Processing. An application for admission to a graduate degree program is processed only after the application and all its supporting credentials have been filed with the Graduate Admissions Office. Any supporting credentials that are received without an application will be maintained on file in the Graduate Admissions Office for one year. All applications and supporting materials for persons who are not admitted or who are admitted but do not enroll in the semester for which they were admitted are maintained on file for one year. Applicants who do not submit their materials in time to be considered for admission to the requested term are expected to notify the Graduate Admissions Office to request consideration for admission to a subsequent term.

Admission Classifications

Admission to one of these categories does not imply and should not be confused with later admission to candidacy for a graduate degree.

Full Standing. Applicants who meet the general requirements for admission to graduate study plus any additional requirements specified by the college or department of academic concentration for the degree sought will be admitted to full standing.

Conditional Standing. Conditional admission to full standing may be granted to students who have: (a) general or special deficiencies which require prerequisites or remedial work; (b) degrees awarded as long as six years prior to admission; or (c) a less clearly predicted chance of success according to available information. Each student granted a conditional admission will be responsible for contacting his/her adviser when he/she has successfully satisfied the conditions for admission to full standing. The adviser will then be responsible for contacting the Graduate School in writing, concerning any request to change the student's admission status.

Provisional Standing. Applicants to master's programs who have not yet completed their undergraduate degree will be provisionally admitted, pending the University's receipt of final transcripts indicating award of the baccalaureate degree.

Readmission. Post-baccalaureate and graduate students whose enrollment is interrupted will remain eligible to register for two calendar years without having to reapply for admission to the University if they are in good standing and have not exceeded the six or eight-year limit for their

degree program. After an absence of more than 24 months, the student must apply for readmission; acceptance is subject to department or program approval.

Students whose enrollment is terminated for academic reasons may request readmission in accordance with academic regulations published in this *Catalog*.

Early-Entry to Graduate Programs. Exceptional undergraduate students may bc accepted into a master's program and begin work toward a graduate degree before completion of the baccalaureate degree. A student may be accepted into the program at any time after completion of 75 or more hours, although it is expected that close to 90 hours will have been earned by the time the first graduate course is taken. These students will have "conditional" acceptance status, pending the awarding of the baccalaureate degree.

To be accepted in this program an undergraduate student must have at least a 3.2 overall GPA and have taken the appropriate graduate standardized test. A given program may have more rigorous admissions criteria. If an early-entry student has not met the normal admission requirements of a 2.75 overall undergraduate GPA and a 3.0 junior-senior GPA at the end of his/her baccalaureate degree, she/he will be dismissed from the graduate program.

Students accepted into an early-entry program will be subject to the same policies that pertain to other matriculated graduate students. Generally, it will be assumed that early-entry students will finish their baccalaureate degrees before they complete 15 hours of graduate work.

Some early-entry programs are also accelerated. Under this model, ordinarily up to six hours earned at the graduate level may be substituted for required undergraduate hours. In other words, up to six hours of graduate work may be "double counted" toward both the baccalaureate and graduate degrees. Individual programs may allow additional hours at the graduate level to be substituted. In no case may more than 12 hours be double-counted.

Auditors. With the consent of the instructor, any student eligible for admission may register for any class for audit. The application procedure and fees are the same as for classes taken for University credit. (See the section on *Academic Regulations* in this *Catalog*.)

Non-Matriculation. An applicant admitted to a degree program who fails to enroll for the term to which he/she has been admitted is presumed to have withdrawn his/her application. The application may be reinstated if the request to do so is received within one year from the originally requested term of entry. This request should be in writing and addressed to the Graduate Admissions Office at least six weeks prior to the term in which the applicant seeks to register.

Post-Baccalaureate Students. Students seeking to take courses beyond the baccalaureate degree for license renewal, for transfer to another institution, as prerequisites for admission to a graduate degree program or for personal satisfaction may be admitted as post-baccalaureate students. Foreign nationals must contact the Office of International Admissions before applying for this classification. The following policies apply to applicants for post-baccalaureate status:

1. Post-baccalaureate students must have a baccalaureate degree from a regionally accredited institution of higher education.
2. Applications for admission must be accompanied by a $35 application fee, which is neither deductible nor refundable.
3. Post-baccalaureate students may register for coursework at any level for which they have the prerequisites.
4. Post-baccalaureate students will be subject to the academic regulations and standards required of degree-seeking students.
5. The post-baccalaureate classification carries with it no implication that a student will be admitted to a degree program.
6. Post-baccalaureate students will be assessed tuition and fees based on the level of courses for which they are enrolled. If enrolled in any course for graduate credit, they will be assessed graduate fees for all courses.
7. A post-baccalaureate student who is subsequently admitted to a graduate degree program may request that a maximum of six hours completed for graduate credit be used for his/her program. All coursework must be approved by the student's department and listed on the student's Admission to Candidacy form.

GENERAL REQUIREMENTS FOR ADMISSION TO A GRADUATE CERTIFICATE PROGRAM

1. A bachelor's degree from a regionally accredited university.
2. Application in writing submitted to the Graduate Admissions Office, accompanied by a $35 application fee, which is neither deductible nor refundable.
3. GPA required for entry to a master's degree program. If the applicant has earned a post-baccalaureate degree, grades in that program will be taken into consideration.
4. Official transcripts. (See program descriptions for specific transcript requirements.)
5. Some programs also may require:
   a. Standardized test scores;
   b. A personal statement outlining why the applicant seeks admission to the program; and
   c. Additional admission requirements as specified.

There may be prerequisites for a graduate certificate program. Students should consult the coordinator for the graduate certificate program to identify prerequisites. Admission to a graduate certificate program does not ensure admission into a graduate degree program.

GENERAL REQUIREMENTS FOR ADMISSION TO A MASTER'S DEGREE PROGRAM

1. Application in writing submitted to the Graduate Admissions Office accompanied by a $35 application fee, which is neither deductible nor refundable. The application for admission and supporting credentials

must be received in the Office of Graduate Admissions at least 45 days prior to the first day of class for the semester in which the applicant plans to enter the Graduate School. (Some programs have earlier deadlines). Materials submitted in support of this application cannot be returned.
2. Possession of a bachelor's degree, or its equivalent, from a regionally accredited college or university.
3. Two official transcripts of all previous academic work attempted beyond high school. Transfer credit posted on the records of other institutions is unacceptable and official transcripts of these credits must be supplied.
4. Official copies of satisfactory test scores as specified in the section on graduate programs in this *Catalog*.
5. An overall grade point average of at least 2.75 (based on a 4.0 scale) on all of the applicant's previous work beyond high school. The average for the junior and senior years must be 3.0 or better.
6. At least three evaluations from persons familiar with the applicant's personal and professional qualifications.
7. An essay describing the applicant's experience and objective in undertaking graduate study.
8. Acceptance into a specific program must be approved by the department or college offering the program. Meeting minimum requirements for admission does not guarantee acceptance into a program. The University reserves the right to restrict enrollments when necessary because of budgetary and other constraints including the availability of faculty expertise in a specified area of study and the enrollment limitation established by the North Carolina General Assembly.

GENERAL REQUIREMENTS FOR ADMISSION AT THE DOCTORAL LEVEL

In order to be considered for admission to a doctoral program, an applicant must have a bachelor's degree from a regionally accredited college or university. Some programs admit baccalaureate students directly to the doctoral program. Others require applicants to have earned a master's degree. To be admitted after a master's program, an applicant should have earned an overall GPA of at least 3.5 (on a 4.0 scale) in the graduate degree program. To be admitted after a bachelor's program, an applicant should have earned an overall GPA of at least 3.0 including a 3.0 for the last four semesters of his/her bachelor's degree. In addition, he/she must submit:

1. A written application accompanied by a $35 application fee, which is neither deductible nor refundable;
2. A satisfactory score on the Graduate Record Examination or in the case of the Ed.D., the GRE or MAT;
3. At least three evaluations from persons familiar with the applicant's personal professional qualifications for graduate study;
4. Two official transcripts of all academic work attempted since high school; and
5. An essay describing applicant's objective in undertaking graduate study.

Applicants with records of high quality who do not fulfill these requirements should discuss with the graduate program coordinator other factors that may have a bearing on admission. Some programs have higher standards or additional admission requirements.

ADDITIONAL ADMISSION REQUIREMENTS FOR INTERNATIONAL APPLICANTS

1. Submission of Official Scores on the Test of English as a Foreign Language or the Michigan Test, if the applicant is from a non-English-speaking country. A TOEFL score of at least 550 is expected.
2. A License of Financial Responsibility must be filed showing the applicant's financial resources during his/her stay in the United States.

All applicants submitting transcripts from non-U.S. educational institutions should note that some bachelor's degrees given by non-U.S. schools are not equivalent to the American bachelor's degree. Recipients of these degrees are not eligible for graduate study at UNC Charlotte.

An I-20 Form will not be issued until the applicant has been admitted to a degree program.

Academic Regulations and Degree Requirements

Student Responsibility

Each student is responsible for the proper completion of his or her academic program, for familiarity with the *University Catalog*, for maintaining the grade average required and for meeting all other degree requirements. The adviser will counsel, but the final responsibility remains that of the student.

A student is required to have knowledge of and observe all regulations pertaining to campus life and student deportment. The University has enacted two codes of student responsibility: **The UNC Charlotte Code of Student Academic Integrity** and **The UNC Charlotte Code of Student Responsibility** which are summarized in this *Catalog*. As students willingly accept the benefit of membership in the UNC Charlotte academic community, they acquire obligations to observe and uphold the principles and standards that define the terms of UNC Charlotte community cooperation and make those benefits possible.

Each student is responsible for maintaining communication with the University and keeping on file with the Registrar's Office at all times a current address, including zip code, and telephone number.

Each student, while associated with the University, is expected to participate in campus community life in a manner that will reflect credit upon the student and the University.

Consult *Academic Regulations and Degree Requirements* in the undergraduate section of this *Catalog* for information about the following University policies and procedures pertaining to graduate students:

Catalog Policies
Registration
Termination of Enrollment
Academic Records and Transcripts
Privacy of Student Educational Records

DUAL UNDERGRADUATE/GRADUATE REGISTRATION

Undergraduate students at UNC Charlotte who are required to take fewer than 12 semester hours of undergraduate work to fulfill all requirements for the bachelor's degree may be allowed during their final semester to enroll in certain courses for the purpose of obtaining graduate credit. Authorization for dual undergraduate/graduate registration may be obtained by submitting to the Dean of the Graduate School a Special Request Form approved by the student's undergraduate academic adviser, the instructor(s) of the graduate course(s), and the dean(s) of the college(s) offering the graduate course(s), accompanied by a post-baccalaureate application. The total hours to be carried in this status shall not exceed 12 hours, of which no more than nine may be for graduate credit. On the basis of work attempted prior to the final semester, such student must meet the grade point criteria for admission to a graduate degree program at the University. No course for which the credit received is applied to an undergraduate degree may receive graduate credit. Permission to take graduate courses under dual registration does not constitute admission to any graduate degree program at the University.

COURSE LOAD

An appropriate course load is dependent upon two factors: the scholastic ability of the student as reflected by his/her academic history and the time available for study. A course load of nine semester hours constitutes a normal full semester program for a graduate student. This is lower than the normal undergraduate load because of the extensive reading, independent thinking and individual research required of graduate students. Generally, graduate students should not register for more than 12 semester hours during a semester.

Nine hours constitutes a full load for a graduate assistant, and a graduate assistant must register for at least six graduate-level semester hours during each semester.

CONTINUOUS REGISTRATION

Students in graduate degree programs are required to maintain continuous registration (fall and spring semesters) for thesis, dissertation, project, or directed study until work is completed. Students are not required to enroll in any summer term unless they are using campus facilities or they are completing degree requirements in that term. Continuous registration begins the semester approval for his/her thesis, dissertation, project, or directed study topic is received. Approval of this topic is documented on the "Petition for Topic Approval" form which is filed by the student with the Graduate School. Students who exceed the required number of hours without completing their work should register for "7999" or "9999" (graduate residence) until the thesis, dissertation, project, or directed study is completed. Ordinarily, students must be enrolled during the term during which they graduate from the university.

CHANGE OF DEGREE PROGRAM

To change from one degree program to another, a graduate student must fill out the application for admission to the new program, pay the $35 application fee, and provide supporting documentation as specified in this *Catalog*. Contact the Graduate Admissions Office for additional information.

GRADING POLICIES

Complete information regarding grading policies, grades, credits, and obtaining transcripts is provided in the undergraduate *Academic Regulations and Degree Requirements* section of this *Catalog*. Students are responsible for familiarizing themselves with that information in addition to the following information pertaining specifically to graduate students:

Graduate Grades

Letter	Meaning	Grade Points Per Semester Hour
A	Commendable	4
B	Satisfactory	3
C	Marginal	2
U	Unsatisfactory	0
I	Incomplete	*
IP	In Progress	*
W	Withdrawal	*
P	Pass	*
N	No Credit	*
AU	Audit	*
NR	No recognition given for audit	*

Certain graduate courses, such as research seminars, tutorials, internships or theses, may be designated for *Pass/No Credit* or *Pass/Unsatisfactory* grading upon recommendation of the offering department and approval of the Graduate Council. The grade of *P* in such a course shall be considered as evidence of satisfactory performance. A grade of *N (No Credit)* will not affect eligibility for continued enrollment nor will it apply toward requirements for the degree.

Grade Point Average. The grade point average for a graduate student is based only on those courses in his/her approved program of study taken at UNC Charlotte. It is determined by multiplying the number of grade points for each grade (*A*=4, *B*=3, *C*=2, *U*=0) by the number of semester hours credit received in that course, adding all accumulated grade points together, and then dividing by the total number of semester hours the student has attempted except those for which the student received a grade of *I, IP, W, P, N, AU,* or *NR*. When a course not listed as "May be repeated for credit" is repeated, no additional credit hours attempted accrue and the hours earned and grade points of the previous grade are replaced by those of the current grade.

Repeating a Graduate Course. A graduate student will be allowed to repeat a maximum of two courses in which the student has been assigned a grade of *C, U* or *N* (but not an *I*). If the course grade has resulted in termination of enrollment, the student must appeal to be reinstated in order to repeat the course. A given course may be repeated one time only. Whenever a course is repeated, no additional hours attempted accrue, and the new grade replaces the previous grade in computing the grade point average and in the assignment of academic credit. The record of the first attempt will remain a part of the student's permanent record and will count in the number of marginal (C) grades accumulated. Successfully repeating a course does not change the number of marginal (C) grades accumulated. Enrollment will be terminated if a student receives a grade of *U* in a repeated course.

REQUIREMENTS FOR CONTINUED ENROLLMENT

A student enrolled in any graduate program must maintain satisfactory progress toward the degree. He/she is expected to achieve a commendable or satisfactory grade (*A* or *B*) in all course work attempted for graduate credit.

An accumulation of three marginal (C) grades will result in termination of the student's enrollment in the graduate program. If a student makes a grade of *U* on any course, enrollment will be terminated.

A graduate student whose enrollment has been terminated because of grades is ineligible to attend any semester or the summer session unless properly readmitted.

A student readmitted to a graduate program through the reapplication procedures will be expected to complete the degree program with satisfactory or commendable performance. Should the student receive a grade of *C* or *U* after being readmitted to the program, his/her enrollment in the graduate program will be terminated.

REQUIREMENTS FOR READMISSION

Students in good standing seeking reinstatement for a term that is two years or more after the term he/she last attended also must apply for readmission to the Graduate School.

Students whose enrollment is terminated for academic reasons must appeal their suspension and be reinstated in order to continue their program of study. After notification of termination is received, the student initiates the appeal procedure by submitting a letter to the Dean of the Graduate School explaining any extenuating circumstances. The Graduate School will forward this letter to the student's program for a recommendation. Letters of appeal from post-baccalaureate students also are sent to the Dean of the Graduate School.

The department/college will designate a readmittance committee to consider the student's appeal. The committee will be composed of faculty members other than the faculty member(s) who assigned the grade of *C* or *U* that resulted in the suspension. The readmission committee recommends to the Dean of the Graduate School that the student either be reinstated to or dropped from the program. The readmission committee makes a recommendation in each case on its individual merits. The student will be notified of the decision in writing by the Dean of the Graduate School.

TRANSFERRED CREDIT

Transferred Credit from Other Institutions. Determining the applicability of transferred credits to graduate program requirements is the responsibility of the student's graduate program coordinator. See "Degree Requirements" section of this catalog for the number of hours that may be transferred and "Time Limit" for completion of courses. General rules governing transferred credit are:

1. Courses applied toward a degree earned at another institution may not be transferred to UNC Charlotte.

2. At the time of admission transferred credit may be accepted from another regionally accredited institution upon approval of the student's adviser and the Dean of the Graduate School.
3. The grade in any course accepted for transferred credit must be the equivalent of that awarded for commendable (*A*) or satisfactory (*B*) work as defined by UNC Charlotte.
4. Courses accepted for transfer are subject to the same time limitation as courses taken in residence.
5. To be considered for transferred credit, the courses must have been undertaken at a regionally accredited institution.
6. Courses in which credit is accepted must be appropriate for approved University programs and curricula in which the student is enrolled.
7. The University is not obligated to accept any credit from another institution. To obtain approval to take a course at another institution and receive transfer credit, a UNC Charlotte student must complete a *Graduate Transfer Credit* request form prior to taking the course and file it in the Graduate School.
8. The student must request that an official transcript be mailed to the Graduate School, listing the course(s) to be transferred upon completion of the course. The *Graduate Transfer Credit* form for this purpose is available in the Registrar's Office or the Graduate School.

Credit by Examination. A student currently enrolled at UNC Charlotte may pass a specially prepared challenge examination and receive credit for a University course without having to do the normal coursework. The student contacts the program in which credit is sought to request administration of an examination. Since it may not be appropriate to award credit by examination for some courses, the decision to offer an examination is that of the program. If the graduate program authorizes an examination, the student is instructed to pay the fee for credit by examination and to bring the receipt of payment to the examination. Credit by examination will be indicated on the transcript, but no grade points will be awarded. Failure on such an examination will incur no grade-point penalty. No student may challenge a course for which either a passing or failing grade has been received at UNC Charlotte.

APPLICATION FOR THE DEGREE

Each student should make application for his/her degree on a form obtained from the Graduate School or the Registrar's Office no later than the filing date specified in the University Calendar. The application must be accompanied by the filing fee in effect at the time of the application. Degrees are awarded at commencement exercises held at the end of the spring and fall semesters; however, the diploma and transcript will reflect the term in which all requirements were completed.

EARNING A SECOND DEGREE

Second Master's Degree. A student is permitted to earn a second master's degree subject to the following conditions: (1) no work applied to a previously awarded degree may be applied to the new degree program; (2) the student must be admitted to a degree program different from that of his/her previous graduate degree(s); and (3) the student must successfully meet all requirements for the new degree.

APPEAL PROCEDURES

Any student or applicant may appeal any decision affecting his/her status as a graduate student, except course grades, by submitting a written petition to the Appeals Committee of the Graduate Council in care of the Graduate School after remedies have been exhausted in the appropriate college.

The petition shall briefly describe the facts which support his/her claim and the remedy being sought. The petition must be submitted within six calendar months of notification of the action being appealed. After receiving the petition, the chairperson of the Appeals Committee will schedule a hearing as soon as possible. A hearing will be held within 60 days of receipt of the written petition of appeal. Evidence will be received from the petitioner and other parties having information bearing on the appeal. The chairperson of the Appeals Committee shall report its decision on any appeals matter (a) directly to the Dean of the Graduate School and (b) to the Graduate Council at the first meeting following the hearing. The Dean of the Graduate School shall advise the petitioner in writing of the decision of the Appeals Committee within 30 days after the end of the hearing. Questions about the procedure should be addressed to the Dean of the Graduate School.

Course grades are appealed through the program offering the course and then, if necessary, through the college in which the grade was assigned. Course grades may not be appealed to the Graduate Council.

MASTER'S DEGREE REQUIREMENTS

Residence Requirements. Generally, **no more than six semester hours of transferred credit are accepted toward a master's degree.** All other work must be residence credit.

Residence credit is credit that is earned under the conditions specified herein and may be applied toward the attainment of graduate degrees at UNC Charlotte. These conditions must be satisfied regardless of the location in which the course is given.

1. Instruction: The instructor must be a member of the UNC Charlotte Graduate Faculty.
2. Course(s): The content of each course must be approved by regularly established college, Graduate School and University curricular processes before the course is scheduled or offered.

Residence credit may also be awarded by virtue of an examination administered by the faculty of the department offering credit. A student also, with the prior approval of the appropriate UNC Charlotte department and of the Dean of the Graduate School, may take graduate courses for residence and course credit at other regionally accredited institutions.

Program Approval. Each student's individual program of study must be approved by his/her department/college. Up to six hours of transferred credit may be included in the approved program of study.

Admission to Candidacy. Upon successful completion of a minimum of 18 semester hours of graduate work and in no case later than four weeks prior to the beginning of the semester in which he/she expects to complete all requisites for the degree, a student should file for admission to candidacy on a form supplied by the Graduate School. This application is a check sheet approved by the student's adviser, department chairperson and college dean listing all coursework to be offered for the degree (including transferred credit and courses in progress).

Minimum Hours and Quality. A student is expected to satisfactorily complete a minimum of 30 to 60 semester hours of approved courses, depending upon his/her individual program, with an overall GPA of 3.0 or better. At least half of the semester hours in the approved program must be in courses numbered 6000 or above. No more than six hours evaluated as *C* may be counted toward the minimum hours required for the master's degree.

Comprehensive Examination. After admission to candidacy, each student must successfully complete a comprehensive examination. The examination may be written, oral, or both, depending upon the student's specific program requirements. Students must be enrolled during the semester in which they take the comprehensive examination.

Time Limit. Candidates must complete all requirements for a master's degree, including accepted transferred credit, within six years of the end of the first semester in which they registered in the Graduate School. Courses that exceed this time limit must be revalidated or retaken--whichever the graduate program decides necessary--if they are to count in a degree program.

Revalidation is ordinarily accomplished by taking a special examination designed by the faculty of the graduate program. Students may not revalidate courses with a grade of *C* or lower, courses that are internships or other forms of practica, or courses taken at other institutions.

A student who is in his/her fifth year and does not anticipate finishing within the allotted time, must meet with the program's graduate coordinator to develop a plan for revalidation of out-of-date courses and completion of the degree program. This plan must be submitted to the Dean of the Graduate School for review and approval.

Thesis. The plan of study for a master's degree may or may not include completion of a thesis. The thesis and non-thesis approaches are designed to meet the needs of students preparing for different types of careers and represent qualitatively different educational experiences. Consequently, the academic departments and the Dean of the Graduate School discourage any switching from one plan to another. If a switch from a thesis to non-thesis plan is approved, the grade of *I* for the thesis work will be changed to *W* on the transcript with no refund of tuition for the course(s). At the time that the graduate program approves the student's thesis topic, the Petition for Topic Approval must be filed with the Graduate School. This form is available in the Graduate School.

The thesis must be submitted for final approval by the student's thesis committee at least three weeks before the date of the oral examination in which the thesis is defended. Following the successful completion of this defense, the master's candidate must submit three unbound copies of the approved and error-free thesis to the Graduate School no later than the filing date indicated in the University Calendar.

Course and Other Requirements. The course and other requirements for specific degree programs are presented in the section of this *Catalog* on Graduate Programs.

Ph.D. DEGREE REQUIREMENTS

The Doctor of Philosophy degree is conferred by the University after the student has demonstrated outstanding scholarship in an approved program of study. Candidates must satisfy all University degree requirements in addition to all standards established by the doctoral faculty of their particular program. Specific program degree requirements are listed under the respective doctoral programs in this *Catalog*. In some cases, requirements in a given program are more stringent than the minimum requirements established by the Graduate School.

Ordinarily, a student must complete at least 72 post-baccalaureate credit hours in order to earn the Ph.D.

Program of Study. The maximum amount of credit that a Ph.D. student may count toward a doctorate from a master's degree program is 30 semester hours. This rule applies whether the master's degree was earned at UNC Charlotte or elsewhere.

If the master's degree was earned at UNC Charlotte, no more than six hours may be transferred from another institution into a doctoral program with the approval of the student's advisory committee. Ordinarily, no transferred hours may be applied to the doctoral program if the master's degree was earned at an institution other than the UNC Charlotte. Applicants with records of high quality who wish to transfer more credit than this policy allows should consult the graduate program.

No more than six hours taken when the student was in post-baccalaureate status may be applied toward the doctoral degree.

Program Approval. By the end of the first semester of the third post-baccalaureate year in the program, and no later than the filing of the petition to sit for the qualifying examination, a student's program of study must be approved by his or her advisory committee and submitted to the Dean of the Graduate School.

Language and Research Tool Requirements. Some doctoral programs require proficiency in a foreign language and/or another research tool. These requirements and the ways to fulfill them are specified in the program descriptions.

Course and Other Program Requirements. The course and other requirements for each degree program are indicated in the program descriptions in the following pages.

Time Limit. Candidates must complete all work beyond the master's degree, including accepted transferred credit, within eight years from the time they first register as doctoral students. Courses that exceed this time limit must be revalidated or retaken--whichever the graduate program decides necessary--if they are to be applied to a degree program. Some programs may require students to complete their degrees in fewer than eight years.

Residence. All doctoral students are required to complete a substantial residency requirement during which they have sustained contact with the graduate faculty. This requirement is specified in the program descriptions.

Graduate Faculty Representative. The graduate faculty representative is a member of the doctoral student's advisory committee appointed by the Graduate School. This faculty member's role is primarily procedural. He/she must (1) assure that the doctoral student is treated fairly and impartially by his or her advisory committee, and (2) assure that University standards and policies are upheld. This representative is appointed prior to the student's taking the qualifying examination and must participate in the examination, in the dissertation topic approval process, and in the final examination. A student's advisor may consult with the Dean of the Graduate School regarding selection of this representative.

Qualifying Examination. Each student must complete a qualifying examination. Students who enter a Ph.D. program directly from a baccalaureate program must sit for this examination before the end of their third post-baccalaureate year in the program; students who enter a Ph.D. program from a master's degree program must sit for it before the end of their first year in the doctoral program. To sit for this examination, the student must have at least a 3.0 GPA and must have removed any conditions upon admission.

Re-examination. A student who fails the qualifying examination may petition the program faculty to be re-examined. The re-examination may take place no sooner than the beginning of the semester following the one in which the failure occurred. A student who fails the qualifying examination a second time may not continue in the doctoral program.

Candidacy. The dissertation topic may be proposed after the student has passed the qualifying examination. A doctoral student advances to candidacy after the dissertation topic has been approved by the student's advisory committee and the Dean of the Graduate School. Candidacy must be achieved at least six months before the degree is conferred.

Dissertation. The doctoral program of study must include 18 hours of dissertation credit. The doctoral candidate must be continuously enrolled in dissertation credit hours beginning with the semester after the dissertation topic is approved until the semester of graduation.

The dissertation must be submitted for final approval by the student's committee at least three weeks before the date of the final examination in which the dissertation is defended. Following the successful completion of this defense, the doctoral candidate must submit three unbound copies of the approved error-free manuscript to the Graduate School no later than the filing date indicated in the University calendar.

The Graduate School requires publication of the dissertation on microfilm and in *Dissertation Abstracts International* by University Microfilms International of Ann Arbor, Michigan. The student is responsible for paying the microfilming and optional copyrighting fees. Any other arrangements for publications of the dissertation must not interfere with publication by University Microfilms International.

Final Examination. Each candidate must pass a final examination over the contents of the dissertation. Sometimes called the "dissertation defense" or the "dissertation oral," this meeting is traditionally open to members of the University community. No student is permitted to take the final examination more than twice.

Ed.D. DEGREE REQUIREMENTS

The Doctor of Education (Ed.D.) degree is conferred by the University after the student has successfully completed all requirements in an approved doctoral program of study in the College of Education. Specific program degree requirements are described in the College of Education section of this *Catalog*.

GRADUATE CERTIFICATE REQUIREMENTS

The graduate certificate is awarded for successful completion of a coherent 12-15 hour program of faculty-directed study proposed by a unit of the graduate faculty and approved by the Graduate Council. Students are admitted to a specific graduate certificate program and are advised by faculty in the unit offering the graduate certificate.

Since the graduate certificate is not a degree, students may apply the credits earned in the certificate program toward a degree that they pursue either in conjunction with the graduate certificate or after the certificate has been awarded.

Students may enroll in a graduate certificate program only or may complete the certificate in conjunction with a graduate degree program at the University. Hours taken toward a graduate certificate may be counted toward a graduate degree program with the consent of the graduate program coordinator.

Graduate certificate programs generally require 12-15 hours, including at least six hours at the 6000-level or above. Up to six hours taken on post-baccalaureate status at UNC Charlotte may be applied toward a certificate with the approval of the program coordinator. Although a student ordinarily may not transfer hours from another

institution into a certificate program, some programs may allow up to six hours of transferred credit. The graduate certificate is awarded to a student who has completed the specified program of study with a GPA of 3.0 or better within four years from the time of enrollment in the first certificate course.

Graduate Programs

Accountancy

Degree: M.ACC. *Coordinator:* Jack Cathey

MASTER OF ACCOUNTANCY

The Master of Accountancy degree program is a multiple track program designed to prepare accountants for the rapidly changing expectations of the profession. It provides for specialization in financial accounting/auditing and in tax and includes the option for development of an individualized program of study. The program is offered in the evening to enable students who are currently employed to continue their employment and to allow time for internships for those not currently employed on a full-time basis. Completion of the program will enable students who are seeking licensure in states requiring 150 semester hours to sit for the CPA Examination.

Additional Admission Requirements. In addition to the general requirements for admission to the Graduate School, the following are required for graduate study in Accounting:

1. Acceptable scores on the verbal and quantitative portions of the Graduate Management Admissions Test.
2. Either a baccalaureate degree in accounting or the completion of the following prerequisite courses or their equivalents with a GPA of 3.0 or higher:

   Intermediate Accounting I & II
   Cost Accounting
   Introduction to Federal Taxation
   Accounting Information Systems
   Auditing

Degree Requirements. The program leading to the Master of Accountancy degree requires at least 30 hours of graduate credit, with a maximum of six hours of transfer credit accepted from another regionally accredited institution upon approval by the student's adviser and the Dean of the Graduate School. At least 80 percent of the course work must be in classes open only to graduate students. A 3.0 GPA is required in all courses taken for graduate credit and a maximum of two C's is permitted for continuation in the program. The residence requirement is satisfied by completion of at least three-fourths of the required courses while in residence. Neither a comprehensive examination nor a thesis is required. The following courses are required:

Financial Accounting/Auditing Track

ACCT 6210	Advanced Accounting Information Systems (3G)
ACCT 6220	Advanced Auditing (3G)
ACCT 6230	Controllership (3G)
ACCT 6150	Business Tax Strategies (3G)
ACCT 6250	Accounting Theory and Practice (3G)

Tax Track

ACCT 6110	Tax Research, Planning and Practices (3G)
ACCT 6120	Taxation of Corporations and Shareholders (3G)
ACCT 6130	Taxation of Partnerships and S Corporations (3G)
ACCT 6140	Taxation of Estates, Gifts, and Trusts (3G)
ACCT 6150	Business Tax Strategies (3G)

Individualized Track

The individualized track requires 30 hours of 6000-level courses selected in consultation with the student's adviser from a list of appropriate courses available from the Department of Accounting.

Architecture

Degree: M.ARCH. *Coordinator*: David Walters

MASTER OF ARCHITECTURE

The Master of Architecture degree serves two groups of students: 1) the three-year M.Arch I program serves students whose previous degree is outside the field of architecture; and 2) the two-year M.Arch II program serves students who have already completed a 4 or 5 year degree program in architecture at an NAAB accredited institution. The courses and options within the program are similar in both programs, but the advanced standing of M.Arch II students allows them to complete the degree requirements in two years. Students in both programs must complete a thesis project approved by the COA Graduate Committee. Full time residency is expected during study in the program.

The M.Arch I Program involves four components: 1) the first year focused on establishing a strong foundation in fundamental design skills, architectural history and theory, and building systems; 2) the second year focused on building technology, comprehensive building design, and urban issues; 3) a summer study experience; and 4) the third year dedicated to individual student architectural thesis investigations.

The M.Arch II Program is tailored through the advising process to the previous educational background of the students and to their individual professional and research goals. The two primary components are 1) the first year focused on building technology, comprehensive building design and urban issues through selected studios and seminars; and 2) the second year dedicated to individual student architectural thesis investigations.

Additional Requirements for Admission. All applicants to the College of Architecture must complete both the application to the UNC Charlotte Graduate School and separate COA requirements.

Degree Requirements. The M.Arch. I Program requires 92 hours to be completed during three academic years and one summer session:

Year I (Fall)

ARCH 6111	Studio (Design Fundamentals/Skills)	7
ARCH 4211	Architectural History I	3
ARCH 6131	Readings in History/Theory I	1
ARCH 6141	Environmental Control System	3
		14

(Spring)

ARCH 6112	Studio (Design Fundamentals/Skills)	6
ARCH 6135	Architectural Theory	3
ARCH 4212	Architectural History 2	3
ARCH 6132	Readings in History/Theory 2	1
ARCH 6142	Structures I	3
		16

Year 2 (Fall)

ARCH 7101	Studio (Comprehensive Bldg. Design)	5
ARCH 6145	Construction/Material Systems	3
ARCH 6133	History/Theory Elective	3
ARCH 6143	Structures 2	3
		14

(Spring)

ARCH 7102	Studio (Urban/Topical)	5
ARCH 6151	Design Methodology	3
ARCH 6134	History/Theory Elective	3
ARCH 6144	Structures 3	3
		14

(Summer)

ARCH 7110	Summer Study Program	6

Year 3 (Fall)

ARCH 7103	Studio (Topical)	5
ARCH 7111	Research Document	3
	Architectural Elective	3
	Architectural Elective	3
		14

(Spring)

ARCH 7104	Thesis Studio	8
ARCH 5112	Professional Practice	3
	Interdisciplinary Elective	3
		14

The M.Arch. II Program requires 44-56 credit hours to be completed during two academic years, including 12 hours of entry level competencies that are evaluated upon acceptance to the program:

Expected Entry Level Competencies

History/Theory ARCH 6133/4 History/Theory Seminar (6)

Building Systems ARCH 6143/4 Structures 2, 3 (6)

Year I (Fall)

ARCH 7101	Studio	5
ARCH 6145	Construction/Material Systems	3
	Architectural Elective	3
		11

(Spring)

ARCH 7102	Studio (Urban/Topical)	5
ARCH 6151	Design Methodology	3
	Architectural Elective	3
		11

(Summer)

ARCH 7110	Summer Study Program	6

(Optional. Replaces 6 credit hours of elective credits)

Year 2 (Fall)

ARCH 7103	Studio (Topical)	5
ARCH 7111	Research Document	3
	Architectural Elective	3
		11

(Spring)

ARCH 7104	Thesis Studio	8
ARCH 5112	Professional Practice	3
		11

Graduate Advising. Critical components of any successful graduate program are academic advising and guidance during the course of a student's program of study. To ensure that incoming students are evaluated appropriately, the College of Architecture requires candidates for the M.Arch. II program to furnish the Graduate Admissions Committee with course descriptions and syllabi of all architecture courses taken during the student's undergraduate career. This information is used to determine entry level competencies in History/Theory and Building Systems, and whether students will be required to take required course work in these areas.

Each student in the M.Arch II program will be asked to identify an adviser by the end of the first year of study who will work with him/her as they begin thesis research. Prior to this time, all graduate students will be advised by the College's Graduate Program Coordinator.

Transfer Credit. Transfer credit is not normally allowed because of the nature of the program. An exception may be made for graduate students to pursue a specific academic offering at another institution as part of their research.

Assistantships. A limited number of assistantships are available. Applications may be obtained from the program coordinator.

Biology

Degrees: M.S., M.A. *Coordinator*: James C. Travis

MASTER OF SCIENCE DEGREE IN BIOLOGY

The Master of Science degree program is designed for students who desire to pursue advanced studies in professional and graduate schools or various vocational opportunities in biology and related areas. The program provides the opportunity for broad training in a variety of biological areas as well as specialization in areas of particular interest to the student. The department is organized into three interest groups reflecting the strengths and research activities of the faculty: Microbiology/ Biotechnology, Cellular/Biomedical, and Ecology/ Environmental. Students may choose one of these as their area of specialization. Also, an arrangement with Carolinas Medical Center in Charlotte allows students to conduct their graduate research at this facility under the direction of one of the hospital staff.

Additional Admission Requirements. In addition to the general requirements for admission to the Graduate School, the following requirements are specific to the Department of Biology:

1. Evidence of undergraduate preparation in biology with a minimum 24 semester hours in biology and 24 semester hours of cognate study.
2. A satisfactory score on the general portions of the Graduate Record Examination.

Degree Requirements. The program leading to the Master of Science degree in Biology requires the successful completion of 30 semester hours of coursework approved by a supervisory committee. At least 16 of these hours, including no more than eight hours of thesis research, must be in courses open to graduate students only. In addition to coursework, each degree candidate must pass an oral candidacy examination. The candidate must also prepare, present and defend a thesis based upon original research acceptable to the Supervisory Committee and the Dean of the Graduate School.

Admission to Candidacy. General academic regulations will apply to application for admission to candidacy. In addition to these the applicant should have:

1. Removed any identified entrance deficiencies by the time of application.
2. Successfully completed the candidacy examination.
3. Taken at least 15 hours of graduate work with a GPA of 3.0 or better.
4. Satisfied the supervisory committee that he/she is qualified to become a candidate, i.e., can fulfill the requirements successfully.

Assistantships. Teaching and research assistantships are available on a competitive basis for qualified students. A limited number of out-of-state and in-state tuition grants are also competitively awarded.

MASTER OF ARTS DEGREE IN BIOLOGY

The Master of Arts degree program is designed for students who choose to write a thesis based upon published scientific literature rather than on laboratory or field research.

Degree Requirements. Students who choose to pursue the Master of Arts degree must complete the requirements for the Master of Science degree with the following exceptions: at least 32 hours of coursework, including two hours of Seminar are required. A maximum of four hours of credit for thesis research may be included in the required 32 hours, and three courses of the 32 hours submitted for the degree must include a formal laboratory.

Business Administration

Degree: M.B.A.; M.B.A. Plus Certificate
Associate Dean for Graduate Studies and Research:
Virginia Geurin

MASTER OF BUSINESS ADMINISTRATION

The primary objective of graduate study in business is to develop candidates for leadership positions in complex organizations. The MBA Program focuses on developing the expertise to lead, influence, and persuade others through effective written and spoken communications; the ability to approach complex problems both systematically and imaginatively; the confidence to make decisions in the face of imperfect information, competing objectives, and technological change; the insight to recognize the ethical dimensions of organizational and individual decisions; the sensitivity to recognize that organizational decisions involve teamwork and consensus-building across diverse groups of individuals; and the awareness that business represents an inherently multinational enterprise that exists without geographical or cultural boundaries.

MBA courses are scheduled to accommodate part-time students and full-time students who may enroll in up to three courses each fall and spring semester. Classes are held in the evening throughout the year on campus and at UNC Charlotte Uptown. A part-time student can complete the program in three years. Full-time students can complete the program in two years, depending upon scheduling of courses. **There is a two-year schedule of MBA courses available in the MBA office to assist students in planning their studies.**

Additional Admission Requirements. In addition to the general requirements for admission to the Graduate School, the following are required for graduate study in Business Administration.

1. A generally satisfactory undergraduate record from an accredited college or university.
2. A satisfactory score on the Graduate Management Admissions Test (GMAT) administered by the Educational Testing Service of Princeton, New Jersey.
3. A description of any significant work experience.

Degree Requirements. The MBA degree program comprises 42 graduate hours including a Functional Component, Applications Component, and a Concentration and Free Electives Component. Up to 12 hours of coursework may be waived based on criteria determined by the relevant academic department. Necessary preparatory work will be determined during the admissions process, and courses to meet the specific need will be available in the Preparatory Component.

Preparatory Component. *(Prerequisites - These classes may be taken as a post-baccalaureate student or after admission to the MBA program. Undergraduates in the Belk College of Business cannot take them for credit toward the bachelor's degree.)*

ACCT	3200	Foundations in Accounting (3)
BLAW	3200	Legal Environment in Business (3)
ECON	3200	Foundations in Economics (3)
INFO	3200	Foundations in Business Computing (3)
OPER	3200	Quantitative Analysis in Business (3) (all students must take this or pass a proficiency exam offered prior to the Fall and Spring terms.)

I. Functional Component. (24 hours)

A. Primary Block (12 hours)
Prerequisites: All requirements for admission to the program and Preparatory Component.

MBAD 6112	The Economics of Business Decisions (3G)
MBAD 6121	Business Information Systems (3G)

MBAD 6131 Managerial Accounting (3G)
MBAD 6141 Operations Management (3G)

B. Intermediate Block (9 hours)
Prerequisites: All requirements for admission to the program. Completion of the Primary Block is strongly recommended.

MBAD 6152 Financial Management (3G)
MBAD 6161 Organizational Leadership & Behavior I (3G)
MBAD 6171 Marketing Management (3G)

C. Advanced Block (3 hours)
Prerequisites: All courses in the Primary Block and the Intermediate Block of the Functional Component.

MBAD 6194 Management Policy (3G)

II. Applications Component (3 hours)
Prerequisites: All courses in the Functional Component

MBAD 6198 Professional Applications (3G)

III. Concentration and Free Elective Component (15 hours)

Students complete 9 hours of elective courses specified for a concentration, and 6 hours in free elective courses. Students who do not choose to complete a concentration will substitute 9 hours in MBA electives for the 9 hours in concentration electives. Students may enroll in electives as soon as they complete the prerequisites for each course.

A. Concentration Block (9 hours)
Prerequisite: Specific course(s) in Functional Component required by each concentration elective.

Accounting
Requirement: Three of the following courses:

MBAD 6132 Financial Reporting (3G)
MBAD 6133 Business Tax Strategies (3G)
MBAD 6134 Controllership (3G)
MBAD 6890 Directed Individual Study (3G)

Business Finance
Requirement: **MBAD 6157** and two of the following courses:

MBAD 6151 Financial Institutions and Markets (3G)
MBAD 6153 Investment Management (3G)
MBAD 6154 Current Topics in Finance (3G)
MBAD 6155 Multinational Finance (3G)
MBAD 6890 Directed Individual Study (3G)

Economics
Requirement: **MBAD 6111** and, upon approval of the Department of Economics Master's Planning Committee, two of the courses listed below. (The committee's approval is required to ensure that students have the mathematical prerequisites necessary for successful completion of the concentration. A student who is denied approval once may petition for approval a second time after receiving a grade of A or B in ECON 4100.)

ECON 6201 Advanced Macroeconomic Theory (3G)
ECON 6202 Advanced Microeconomic Theory (3G)
ECON 6112 Graduate Econometrics (3G)
ECON 6218 Advanced Business Forecasting (3G)

Financial Institutions/Commercial Banking
Requirement: **MBAD 6156** and two of the following courses:

MBAD 6151 Financial Institutions and Markets (3G)
MBAD 6153 Investment Management (3G)
MBAD 6154 Current Topics in Finance (3G)
MBAD 6155 Multinational Finance (3G)
MBAD 6890 Directed Individual Study (3G)

Information and Technology Management
Requirement: Three of the following courses:

MBAD 6028 Topics in Business Info. Systems (3G)
MBAD 6122 Decision Sciences (3G)
MBAD 6124 Business Info. Systems Development (3G)
MBAD 6125 Business Data Communications (3G)
MBAD 6890 Directed Individual Study (3G)

Management
Requirement: Three of the following courses:

MBAD 6162 Organizational Leadership and Behavior II (3G)
MBAD 6163 Human Resource Management (3G)
MBAD 6164 Executive Communication (3G)
MBAD 6191 Entrepreneurship (3G)
MBAD 6192 Business and Society (3G)
MBAD 6193 International Business Concepts (3G)
MBAD 6195 Strategic Mgmt. of Technology (3G)
MBAD 6196 Strategic Planning (3G)
MBAD 6197 International Business Strategy (3G)
MBAD 6890 Directed Individual Study (3G)

Marketing
Requirements: Three of the following courses:

MBAD 6172 Marketing Research (3G)
MBAD 6173 Promotional Strategy (3G)
MBAD 6174 International Marketing (3G)
MBAD 6175 Logistics Management (3G)
MBAD 6890 Directed Individual Study (3G)

Student Structured Concentration
Students may propose a 9 semester hour, three course concentration in a significant area of interest for approval by the director of the MBA Program. This concentration may include graduate courses from other programs within the University.

B. Free Electives Block (6 hours)
Prerequisites: Specific courses in the Functional Component required by each free elective.

Students are strongly encouraged to select courses outside their area of concentration and to include a course with an international/global perspective as one of their free elective courses.

Minor in Operations Research. The Master of Business Administration program also participates in the program leading to an interdisciplinary graduate minor in Operations Research. See the listing for *Operations Research* for complete information and program requirements.

Admission to Candidacy. An Admission to Candidacy form listing graduate-level courses that apply to the degree must be

submitted to the MBA Office two weeks prior to the semester in which the student plans to complete the coursework for the degree.

Application for Degree. An Application for Degree form must be completed and submitted with the graduation fee to the Registrar's Office by the published deadline.

Assistantships. A number of assistantships are available each year. In order to be competitive, applications should be submitted by March 15. Additional information is available in the MBA office.

MBA PLUS GRADUATE CERTIFICATE

The MBA PLUS Graduate Certificate Program provides an opportunity for graduates of MBA Programs to broaden and update their business education. As business conditions, tools, and techniques change rapidly, a major way of staying at the forefront of knowledge is through additional university education. The MBA PLUS Certificate makes courses in the Belk College's MBA Concentrations available to persons who already have MBA degrees.

Admission Requirements. Applicants must satisfy the general requirements established by the Graduate School for admission to a graduate certificate program. In addition, applicants must provide an official transcript indicating the awarding of an MBA degree. (Graduates from the MBA program at UNC Charlotte are not required to send an official transcript.) Applicants will **not** be required to retake the GMAT.

Completion Requirements. The MBA PLUS Certificate requires completion of twelve or more semester hours of 6000-level courses. At least nine hours included in the student's program must be elective courses specified for the MBA Concentrations offered by the College. One 3-hour course may be a repeat of a course previously taken. This may be desirable if there has been a substantial content change in the area of interest since the student completed the MBA degree. A student may repeat more courses, but only one such repeated course will be counted toward the certificate. The nine hour elective requirement of the MBA PLUS corresponds to the nine hour concentrations in the MBA Program.

It is expected that most students will use their twelve hours or more to gain a concentration in a particular functional area of interest. However, a broader program that draws from a number of areas will be allowed with approval of the MBA Director.

Transfer credits are not accepted in the MBA PLUS Certificate Program. To receive the certificate, students must complete all courses with a grade of "B" or better within four years from the time of enrollment in the first certificate course.

An Application for Graduate Certificate (candidacy form) and an Application for Degree should be completed prior to the last semester of MBA PLUS course work.

Chemistry

Degree: M.S. *Coordinator:* Craig A. Ogle

MASTER OF SCIENCE DEGREE IN CHEMISTRY

The Chemistry Department offers a research-based Master of Science (M.S.) degree, which provides the background necessary for a career in industry or for further graduate studies in chemistry and related fields. The M.S. degree requires a minimum of 30 credit hours and a thesis based on original research carried out under the direction of a member of the graduate faculty. Student participation in research activities is through selection of a faculty adviser and enrollment in the special research courses offered in the summer sessions and during the academic year. Major emphasis is placed upon the research project and required thesis. UNC Charlotte B.S. degree chemistry majors may elect to participate in the five year BS-MS program (described in the undergraduate section of this catalog).

Additional Admission Requirements. In addition to the general requirements for admission to the Graduate School, the following are required for graduate study in Chemistry:

1. A satisfactory score on the Aptitude Portion of the Graduate Record Examination.
2. Conditional admission of students judged by the Chemistry department to be deficient in their training.
3. Administration of placement examinations by the department each semester just prior to registration as an aid in identifying such deficiencies.
4. Removal of any deficiencies within one year by remedial study directed by the department.
5. A score of 45 or better is required on the Test of Spoken English.

Degree Requirements. The candidate for the degree must present a minimum of 30 semester hours including at least 15 semester hours in 6000-level courses open to graduate students only. Required courses include CHEM 4111, 4121, 4133, either 4134 or 4135, 6682 and 6900. Two semester hours of graduate seminar, CHEM 6682, and at least one, but up to 16 semester hours of research and thesis credit, CHEM 6900, must be presented. In addition, six semester hours from the coursegroup CHEM 6115, 6125, 6135, 6138, 6145, 6146 or 6060 are required. Departmental approval is necessary before CHEM 6060 credit can be used to satisfy this requirement. Any 4000 level or higher mathematics or physics course except those designed for a professional education sequence may be taken for graduate credit. Well-prepared students, particularly those with degrees from ACS-approved programs, will normally satisfy the requirement for CHEM 4111, 4121, 4133, and 4134, or 4135 through placement examinations administered after admission. In those cases, hours that would have been earned for these courses may be replaced by research, CHEM 6900, or by elective courses. A grade point average of 3.0 is required for the degree. In addition, the thesis must be accepted within six calendar years after admission into the M.S. program as a degree student. This includes a successful defense of the written thesis before a special thesis committee of no fewer than four persons, at least one of whom must be from outside of the Chemistry Department.

Approval of the program of each student and monitoring his/her progress toward the degree is the responsibility of the student's research adviser. Prior to the selection of a research adviser, graduate student progress is monitored by the departmental Graduate Committee.

A student in the chemistry M.S. program is required to maintain satisfactory progress toward the degree. Continued enrollment is at all times subject to review on the basis of academic record. This review is performed by the departmental Graduate Committee.

Comprehensive Examination. None is required.

Admission to Candidacy. An *Admission to Candidacy* form must be submitted approximately one month prior to the beginning of the semester in which the graduate student expects to complete all requisites for the M.S. degree.

Assistantships. Graduate students generally support their education through teaching or research assistantships available through the Chemistry Department. Further information is available in the Department.

Research Experiences. The Chemistry Department offers research opportunities in such areas as laser spectroscopy, computational chemistry, microelectronics, microcomputer controlled instrumentation, biological chemistry, environmental chemistry and toxicology, chemical reactivity, organometallic chemistry, the structure and design of molecules, atmospheric chemistry, chemical dynamics, electrochemistry and chemical separation technology. Students receive academic credit for their research and may obtain financial assistance in the form of a stipend to support their research in the summer. The low student-to-faculty ratio in the Chemistry Department permits close faculty-student interaction throughout the student's research experience. Research in the Department is funded in part from competitive grants obtained from agencies such as the American Chemical Society, National Science Foundation, Department of Energy, Research Corporation, N.C. State Board of Science and Technology, and the Office of Naval Research.

Computer Science

Degree: M.S. *Coordinator*: Ken Chen

MASTER OF SCIENCE DEGREE IN COMPUTER SCIENCE

The object of the computer science program leading to the Master of Science degree is to provide advanced skills and knowledge in the planning, design, implementation, testing, and management of computer systems. These skills are necessary for dealing with the problems encountered in business, industry, and governmental computer applications; for holding administrative or engineering positions requiring the planning and implementation of computer systems; for teaching computer science; and/or for further study in computer science, in particular, for doctoral study.

The primary areas of interest are artificial intelligence and its applications, computer engineering, database design and implementation, distributed systems, operating systems, and theoretical computer science.

Minor in Operations Research. The Department of Computer Science participates in the program leading to an interdisciplinary graduate minor in Operations Research. See *Operations Research Section* of this *Catalog* for complete information and program requirements.

Additional Admission Requirements. In addition to the general requirements for admission to the graduate school the following are required for graduate study in Computer Science:

1. Evidence of satisfactory undergraduate preparation, with an overall undergraduate grade point average of at least 2.8 (on a 4.0 scale) and a grade point average of at least 3.0 on the last 60 hours attempted.

2. A background in mathematics to include at least two semesters of calculus, one semester of linear algebra, and one semester of discrete structures.

3. A working knowledge of two high-level programming languages, an assembly language; computer data structures; computer architecture/organization; at least one of which is procedural; and familiarity with computer applications. Such knowledge is usually manifested by completion of university coursework with a GPA of at least 3.0.

4. Submission of satisfactory scores on the Aptitude Portion of the Graduate Record Examination. (The advanced test in Computer Science is not required, but may be submitted for consideration.)

5. Individuals who have worked at a high professional level in the eomputer industry may be able to substitute work experience for specific subject area admission requirements. Approval of such substitution is at the discretion of the Computer Science Department.

6. Students with special backgrounds who do not meet all of the above requirements may be considered for admission on a conditional basis. Any such conditions will be clearly stated and agreed to before admission is completed.

Degree Requirements. Candidates for the Master of Science degree in Computer Science have the option of : (a) completing 30 semester hours of coursework, writing an expository essay, and passing a comprehensive examination; or (b) completing 24 hours of coursework, writing a thesis for six hours of credit, and passing a comprehensive examination. Either option can be completed on a full-time or part-time basis.

All students are required to complete or have the equivalent of CSCI 5102, 5112, 6114 , and CPGR 5141 for a total of 12 semester hours. Each student will select with his or her academic adviser 12 to 18 semester hours of additional coursework to meet program requirements or career goals.

A maximum of six semester hours of graduate credit may be transferred from other institutions.

Comprehensive Examination. Successful completion of a written comprehensive examination is required. The examination covers the following core areas: algorithms and data structures, computer organization and architecture, and programming languages. The examination is given twice a year in March and October. A student is allowed to repeat the examination only once. Failure on the comprehensive examination a second time results in the student's removal from the program.

Graduate Assistantships. Graduate teaching and research assistantships are available to qualified students on a competitive basis. The deadline for graduate teaching assistantship applications is March 31 for the following academic year.

Criminal Justice

Degree: M.S. *Coordinator*: David Hirschel

MASTER OF SCIENCE DEGREE IN CRIMINAL JUSTICE

The Master of Science degree program in Criminal Justice is designed to promote broad based study of the phenomenon of crime and to enhance career opportunities in the field of criminal justice. The program utilizes the social and behavioral sciences in an interdisciplinary approach to study law, crime, and social deviance, and to examine critically the systems created in response to deviance and crime. The objectives of the program are to: (1) provide present and future criminal justice personnel with the educational background necessary to function effectively in the dynamic field of criminal justice; (2) familiarize students with the nature, methods, and functions of research, and with the existing body of knowledge on criminal justice; (3) provide the criminal justice system with qualified candidates for careers in the field; and (4) prepare students for entrance into doctoral programs. Career opportunities available in the criminal justice system include law enforcement, corrections, administration, planning and analysis, juvenile justice, and college instruction. There are also private sector careers available, including private security.

Students may enroll in the program on either a full-time or part-time basis. Classes usually are scheduled in the evening to accommodate the part-time student.

Additional Admission Requirements. Admission to the Criminal Justice graduate program is open to students with bachelor's degrees in any discipline who meet the general requirements for admission to the Graduate School, provided they meet the following requirements. Applicants must have a grade point average of at least 2.75 and a satisfactory score on the Graduate Record Examination (GRE) or the Miller Analogies Test (MAT). To ensure competence in the basic concepts of criminal justice, incoming students must demonstrate or establish proficiency with the materials offered in the following three undergraduate courses: CJUS 1100 (Introduction to Criminal Justice); CJUS 3100 (Criminal Justice Theory); and CJUS 3101 (Research Methods in Criminal Justice).

Degree Requirements. A minimum of 36 semester hours is required. Eighteen of these 36 hours must be in courses open only to graduate students (6000 level and above). All students must complete each of the following four core courses with a grade of *B* or above: CJUS 6100 (The Criminal Justice System); CJUS 6101 (The Nature and Theory of Crime); CJUS 6102 (Research in Criminal Justice); and CJUS 6104 (Criminal Justice and Social Control). A maximum of 12 hours may be taken outside the Criminal Justice Department, and a maximum of six hours with grades of *B* or above may be transferred from another institution. Transfer courses must be consistent with the program and will be accepted at the discretion of the department. At least 30 semester hours must be taken in residence. Students must complete one of the following options: (1) passing 36 semester hours of coursework and a comprehensive written examination; or (2) preparing a thesis which counts as six of the required 36 semester hours. A thesis, an extensive research project, may encompass a philosophical, theoretical, methodological, legal, or empirical approach to the study of crime or criminal justice. To enter the thesis track, a student must form a thesis committee with at least two faculty members from the Criminal Justice Department and have a thesis proposal approved by the thesis committee.

Comprehensive Examination. The comprehensive examination is offered each year in November and April. Since the examination requires integration of materials covered in all graduate courses, it is recommended that it be taken close to the completion of the degree. However, anyone who has successfully completed 21 semester hours, including passing all four core courses with *B* or above, is eligible to take the examination. The comprehensive examination may be taken no more than three times.

Assistantships. The Criminal Justice Department offers graduate assistantships which are awarded solely on the basis of academic merit.

Additional Financial Aid. In addition to the graduate assistantships, the department offers, as available, research assistantships and grant-funded opportunities for students. In addition, the competitive Dean Reep Scholarship is available for an incoming graduate student each year.

Economics

Degree: M.S. *Coordinator*: Ronald A. Madsen

MASTER OF SCIENCE IN ECONOMICS

The Master of Science degree program in Economics features a curriculum that is flexible yet thorough in its approach to theoretical training and applied coursework. The program offers concentrations in Economics and in Economics/Finance. Students who complete this program are prepared for staff and management positions that require the integration of economic analysis and advanced quantitative methods in the public or private sector, to teach at the community college level, or to pursue additional graduate education leading to the Ph.D. degree in Economics or in Finance.

Minor in Operations Research. The Department of Economics also participates in the program leading to an interdisciplinary graduate minor in Operations Research. See *Operations Research Section* of this *Catalog* for complete information and program requirements.

Additional Admission Requirements. In addition to the general requirements for admission to the Graduate School, the following are required for graduate study in Economics:

1. Undergraduate coursework that includes: Calculus, Statistics (or Econometrics), Intermediate Macroeconomic Theory, Intermediate Microeconomic Theory, and Mathematical Economics. (Students missing some of these courses can be admitted conditionally.)

2. A satisfactory score on the aptitude portion of the Graduate Record Examination. The Graduate Management Aptitude Test may be substituted for the GRE with the permission of the program coordinator.

Degree Requirements. The program leading to the Master of Science degree in Economics requires at least 30 hours of graduate credit, with a maximum of six hours of transfer credit accepted from an accredited institution. (Credit applied toward an awarded graduate degree will not be accepted as transfer credit.) Courses taken at other accredited institutions after enrollment may receive residence credit if approved by the department and the Dean of the Graduate School. At least half of the credit hours applied toward the degree must be in courses open only to graduate students. No more than two *C*'s are permitted in the program and at least 18 semester hours must be completed before admission to candidacy. A GPA of at least 3.0 is required to graduate. The program is organized into three curriculum components: (1) a core curriculum in economic theory, econometrics, and forecasting; (2) an individualized curriculum of interrelated coursework; and (3) a research project tailored to the needs of terminal master's students or a thesis for students considering doctoral study in economics.

Core Curriculum

ECON 6201	Advanced Macroeconomic Theory (3G)
ECON 6202	Advanced Microeconomic Theory (3G)
ECON 6112	Graduate Econometrics (3G)
ECON 6218	Advanced Business and Economic Forecasting (3G)

In addition, students who choose to complete a thesis must successfully complete ECON 6999 (Master's Thesis), while students enrolled in the non-thesis option must complete ECON 6901 and ECON 6902 (Research Methods I and Research Methods II).

Individualized Curriculum

The purpose of the individualized curriculum is to provide students with the opportunity to acquire specialized theoretical skills related to their areas of interest and expertise. Elective fields of interest could include monetary policy, finance and banking, international trade and international finance, economic analysis for business decision making, urban economics, or economic and business forecasting. The program also permits the development of individualized specializations in areas that are complementary to economic theory and analysis.

Economics/Finance Concentration

The Economics/Finance Concentration is designed for students seeking careers in banking or other financial institutions, as well as regulatory bodies dealing with financial markets. The Economics/Finance concentration can also provide an excellent foundation for students who wish to pursue additional graduate study leading to a Ph.D. or D.B.A. degree in Finance.

The Economics/Finance major must complete the core curriculum for the M.S. in Economics, and the thesis or research project. In addition, the Economics/Finance major must complete the following:

FINN 6152	Financial Management (3G) (Prerequisite: MBAD 6131 or 6 hours of undergraduate accounting and approval of the Graduate Coordinator).
FINN 6157	Theory of Corporate Finance (3G)

One of the following:

FINN 6151	Financial Institutions and Markets (3G)
FINN 6153	Investment Management (3G)
FINN 6155	Multinational Finance (3G)
FINN 6156	Commercial Bank Managment (3G)

Assistantships. A number of graduate assistantships are available each year. To be fully competitive, applications must be submitted by March 15. Further information is available in the Economics Department.

In-State and Out-of-State Tuition Waivers. A limited number of tuition waivers are made available each year. These waivers are competitively awarded using the same application required for assistantships.

Education

The College of Education is accredited by the National Council for Accreditation of Teacher Education (NCATE) and approved by the North Carolina Department of Public Instruction (NCDPI) to offer master's degree programs in nine areas and a doctoral program in Educational Leadership. The College also offers a graduate certificate program in Supported Employment and Transition. Courses in these programs are scheduled on campus and through distance learning facilities in the evening, on weekends, and in summer at times convenient for graduate students who are also full-time teachers, administrators, or specialists in other roles.

Graduate Degrees and Certificates. The College of Education offers the following graduate degrees and certificates:

- **Master of Education (M.Ed.)** degrees in Elementary Education; Middle Grades Education; Secondary Education; Special Education; Reading, Language, and Literacy; Teaching English as a Second Language; and Instructional Systems Technology.

- **Master of Arts (M.A.)** degree in Counseling with a specialization in either School Counseling or Community Counseling.
- **Master of School Administration (M.S.A.)** degree in School Administration.
- **Doctor of Education (Ed.D.)** degree in Educational Leadership. Upon completion of doctoral course work, students are awarded a Certificate of Advanced Study in Educational Administration.
- **Graduate Certificate** in Supported Employment and Transition.

Graduate-Level Licensure by the North Carolina Department of Public Instruction. The following master's degree programs lead to graduate-level ("G") licensure in North Carolina: Elementary Education, Middle Grades Education, Secondary Education, Special Education (six areas of specialization), Reading, Teaching English as a Second Language, and Instructional Technology Specialist: Computers. Students pursuing licensure in areas of secondary education may elect to complete a graduate major in Education or in an appropriate discipline in the College of Arts and Sciences.

The master's degree program in school counseling leads to "G" licensure in K-12 Counseling. The master's degree program in school administration leads to "G" licensure as both a principal and a curriculum and instruction specialist, and the doctoral program in educational leadership leads to licensure for the superintendency.

Non-degree Options for Teacher Licensure. Persons who hold baccalaureate degrees in areas other than Education and who seek initial teacher licensure in North Carolina may apply for admission to one of the following teacher education programs as a post-baccalaureate licensure-only student: Birth to Kindergarten Education, Elementary Education, Middle Grades Education, Secondary Education (English, history, mathematics, physics, chemistry, biology, earth sciences, comprehensive science, or comprehensive social studies), Foreign Language Education (French, German, or Spanish), or Fine and Performing Arts Education (art, dance, music, or theatre arts).

The requirements for post-baccalaureate licensure-only students are essentially the same as those for undergraduate degree students enrolled in the same teacher education program. Specific course requirements are based on an evaluation of each student's transcripts and other credentials that is conducted by staff in the College's Office of Student Academic Services. To obtain this evaluation, the potential student must:

1. Submit to the Graduate Admissions Office an application for post-baccalaureate student enrollment, which includes a non-refundable application fee of $35.00;
2. Provide *official* copies of academic transcripts from all universities previously attended; and
3. Submit to the Office of Student Academic Services in the College of Education a packet that includes a completed "Request for Transcript Evaluation," a copy of the letter of acceptance received from the Graduate School, and *official* copies of academic transcripts from all universities and colleges previously attended.

Students who subsequently apply for admission to a specific teacher education program as a post-baccalaureate licensure-only student must meet the criteria for admission to that program. **Enrollment as a post-baccalaureate student does not guarantee admission to a teacher education program.**

Persons who are already licensed as teachers, counselors, or administrators, and who are interested in licensure renewal or add-on licensure in some areas may take graduate courses in the College of Education as non-degree students. It is not possible, however, to earn licensure in either school administration or school counseling without completing the full master's degree program in those areas.

Academic Advising. Upon admission, each student is assigned a faculty adviser who helps the student develop his or her program of study and must approve that program of study. Each student must also assemble a graduate committee for consultation and evaluation. Members of the committee include the student's faculty adviser and at least two other faculty members who represent major areas of concentration in the student's program.

Assistantships. Each department in the College of Education funds a limited number of graduate teaching assistantships. Information about these assistantships, including application materials, is available in department offices.

Elementary Education

Degree: M.Ed. *Coordinator:* Robert Audette
Department: Reading and Elementary Education (REEL)

The M.Ed. program in Elementary Education qualifies graduates for an advanced-level ("G") license in elementary education and builds upon both a body of knowledge and practical expertise relevant to teaching children in grades K-6.

Program Objectives. As experienced elementary school teachers, graduates of the program are prepared to: design, implement, and evaluate elementary school curriculum and instruction; interpret and apply current research findings in elementary education and child development; conduct classroom research; and be self-reflective teachers and lifelong learners.

Additional Admission Requirements. In addition to the general requirements for admission to the Graduate School, applicants must hold an "A" level license in elementary education from the North Carolina Department of Public Instruction (or its equivalent from another state).

Degree Requirements. The M.Ed. program in Elementary Education requires a total of 36 hours of core courses, specialization courses, support courses, and elective courses:

Core Courses (6 hours)

EDUC 6100	Theories of Human Development and Learning (3G)
RSCH 6101	Educational Research Methods (3G)

Specialization Courses (15 hours)

ELED 6221	Teaching and Learning K-6 Science (3G)
ELED 6241	Teaching and Learning K-6 Social Studies (3G)
ELED 6252	Teaching and Learning K-6 Mathematics (3G) **OR**
MAED 5101	Arithmetic in the School (3G)
ELED 6474	Analysis of Teaching/Practicum: K-6 Elementary Education (3G)
ELED 6991	Research Project in Elementary Education (3G)

Support Courses (9 hours)

CHFD 6102	Learning and Development (3G)
SPED 6254	Individualizing Instruction for Regular and Special Needs Students (3G)
READ 6250	Language Development and Reading (3G) **OR**
READ 5270	Trends and Issues in Reading and Language Arts (3G)

Elective Courses (6 hours)
These courses must be approved by the student's adviser.

Capstone Experience. Students must complete an action research project (ELED 6991, Research Project in Elementary Education), which may be a research study or a program development activity designed, carried out, and evaluated by students under the direction of their graduate committee.

Middle Grades Education

Degree: M.Ed. *Coordinator:* Eugene Schaffer
Department: Middle, Secondary, and K-12 Education (MDSK)

The M.Ed. program in Middle Grades Education qualifies graduates for an advanced level ("G") license in middle grades education and builds upon a body of knowledge and practical expertise relevant to teaching children in grades 6-9.

Program Objectives. As experienced middle grades teachers, graduates of the program are prepared to: implement a middle grades philosophy to the fullest extent possible; engage in meaningful collaborative research projects; design curriculum that is integrated, competency- and technology-based, and relevant to students' future academic and career expectations; employ teaching methodologies relevant to the unique needs of early adolescents; and operate from common attitudes of pervasive caring and innovative leadership.

Additional Admission Requirements. In addition to the general requirements for admission to the Graduate School, applicants must hold an "A" level license issued by the North Carolina Department of Public Instruction (or its equivalent from another state).

Degree Requirements. The M.Ed. program in Middle Grades Education requires a total of 36 hours of core courses, specialization courses, content courses, and elective courses:

Core Courses (9 hours)

EDUC 6100	Theories of Human Development and Learning (3G)
RSCH 6101	Educational Research Methods (3G)
CURR 6120	Curriculum Theory (3G) **OR**
RSCH 6109	Assessment and Evaluation Methods (3G) **OR**
CURR 6150	Models of Teaching (3G)

Specialization Courses (9 hours)

MDSK 6220	Adolescence and Learning (3G)
MDLG 6000	Topics in Middle Grades Education (1-6G)
EDUC 6473	Middle Grades Internship and Seminar (3-6G)

Content Courses (12 hours)
These courses are selected from one of the following content areas: mathematics, communication skills, social studies, or science.

Elective Courses (6 hours)
One course selected from the following:

CURR 6121	Planning for K-12 Instruction (3G)
EIST 6135	Learning Media, Resources, and Technology (3G)
EIST 4135	Audiovisual Communications (3G)
EIST 4100	Computer Applications in Education (3G)
MDLG 6800	Individual Study in Middle Grades Education (1-6G)
MAED 5104	Microcomputing for Teachers (3G) (required for mathematics content specialization)

A second course selected from the following:

MDSK 6250	Issues in 6-12 Science Education (3G)
MDSK 6251	Issues in 6-12 Mathematics Education (3G)
ELED 6252	Teaching and Learning K-6 Mathematics (3G)
MDSK 6254	Issues in 6-12 Social Studies Education (3G)
READ 5270	Trends and Issues in Reading and Language Arts (3G)

Capstone Experience. Students must complete either a master's project or a written comprehensive examination. The project may take the form of a thesis, research study, or program development activity. The examination is designed to require synthesis of a student's course work in the program. Both the project and the examination are followed by an oral examination in which the student clarifies, expands, and defends his or her master's project or comprehensive examination.

Secondary Education

Degree: M.Ed. *Coordinator*: Eugene Schaffer
Department: Middle, Secondary, and K-12 Education (MDSK)

The M.Ed. program in Secondary Education qualifies graduates for an advanced-level ("G") license in secondary education with an academic specialization in English, social studies, mathematics, biology, chemistry, physics, or earth sciences and builds upon a body of knowledge and practical expertise relevant to teaching a specific subject to children in grades 9-12. The program includes advanced study in an academic discipline and in the following areas of professional education: research methodology, curriculum theory, analysis of teaching, materials development, and application of technology in teaching.

Program Objectives. As experienced secondary school teachers, graduates of the program are prepared to: design, implement, and evaluate secondary school curriculum and instruction; interpret and apply current research findings in secondary education and adolescent development; conduct classroom research; and be self-reflective teachers and lifelong learners.

Additional Admission Requirements. In addition to the general requirements for admission to the Graduate School, applicants must have a satisfactory grade-point average in prior course work in the academic discipline in which they seek advanced licensure; they also must hold an "A" level license in a content area in secondary education issued by the North Carolina Department of Public Instruction (or another state).

Degree Requirements. The M.Ed. program in Secondary Education requires a total of 36 hours of core courses, specialization courses, and content courses:

Core Courses (9 hours)
RSCH 6101 Educational Research Methods (3G)
CURR 6120 Curriculum Theory (3G)
SECD 6475 Secondary Internship and Seminar (3-6G)

Specialization Courses (9 hours)
EIST 6135 Learning Media, Resources, and Technology (3G)
CURR 6150 Models of Teaching (3G)
And an advanced methods course in the specialty area for which licensure is sought:
MDSK 6251 Issues in 6-12 Mathematics Education (3G) **OR**
MDSK 6250 Issues in 6-12 Science Education (3G) **OR**
MDSK 6254 Issues in 6-12 Social Studies Education (3G) **OR**
READ 6255 Reading and Writing in Content Areas (3G)

Content Courses (18 hours)
These courses are selected in the content area in which advanced level ("G") licensure is sought. If available, a disciplinary area research methodology course is included in this series of content specialization courses.

Capstone Experience. Students must complete either a master's project or a written comprehensive examination. The project may take the form of a thesis, research study, or program development activity. The examination is designed to require synthesis of a student's course work in the program. Both the project and the examination are followed by an oral examination in which the student clarifies, expands, and defends his or her master's project or comprehensive examination.

Special Education

Degree: M.Ed. *Coordinator*: David W. Test
Graduate Certificate: Supported Employment and Transition
Department: Counseling, Special Education, and Child Development (CSPC)

MASTER OF EDUCATION IN SPECIAL EDUCATION

The M.Ed. program in Special Education prepares professional personnel for teaching and administrative roles in public and private institutions, including public schools, state institutions, and nonprofit agencies, that provide educational services to children, youth, and adults who have special needs. Completion of all program specializations, except Academically Gifted, qualifies graduates for an advanced-level ("G") license in the specialization. Individuals who are interested in teaching learners who are academically or intellectually gifted can earn an add-on K-12 license in academically gifted if (1) they already hold either an "A" or "G" level teaching license in elementary, middle grades, or a content area in secondary education and (2) they complete either the full M.Ed. program in Special Education with a specialization in Academically Gifted or a 12-hour set of specified courses.

Under a pilot project beginning in 1997, the M.Ed. Program in Special Education will be delivered to selected community college sites using the North Carolina Information Highway (NCIH), an interactive audio/video network. Students participating in the pilot project will take most of their courses at the community college site and will attend classes at UNC Charlotte in the summer.

Program Objectives. As prospective or experienced special education teachers, graduates of the program are prepared to: provide leadership in the field of special education; provide individually planned, systematically implemented, and carefully evaluated instruction; and promote the greatest possible personal self-sufficiency and success for students with special needs.

Additional Admission Requirements. In addition to the general requirements for admission to the Graduate School, applicants must hold an "A" level license in any teaching field from the North Carolina Department of Public Instruction (or its equivalent from another state). The "A" level license held by applicants to the program's specialization in Academically Gifted must be in elementary education, middle grades education, or a content area in secondary education. Applicants to all other specializations in the program who do not hold an "A" level license may be conditionally admitted to the program, but they must satisfactorily complete the following 21 hours of prerequisite "A" level licensure courses prior to full admission to the program:

EDUC 6102 The Person and School in Urban Society (3G)
CURR 6121 Planning for K-12 Instruction (3G)
CURR 6110 Research and Analysis of K-12 Teaching (3G)
EIST 4100 Computer Applications in Education (3G)
SPED 6470 Special Education Clinical Experience (3G)
SPED 4276 Teaching Language Arts to Learners with Mental Handicaps (3G) **OR**
READ 5000 Topics in Reading, Language, and Literacy (3G)
SPED 3272 Teaching Mathematics to Learners with Mental Handicaps (3) **OR**
ELED 6252 Teaching and Learning K-6 Mathematics (3G)

Degree Requirements. The M.Ed. program in Special Education includes a series of teacher education core courses, special education core courses, specialization courses, and

elective courses. Approved electives may be used towards the chosen specialization and also towards graduate licensure in another specialization within Special Education.

Capstone Experience. Students must complete either a master's project or a written comprehensive examination. The project may take the form of a thesis, research study, or program development activity. The examination is designed to require synthesis of a student's course work in the program. Both the project and examination are followed by an oral examination in which the student clarifies, expands, and defends his or her master's project or comprehensive examination.

Specialization in Behavioral-Emotional Handicaps

This program prepares educational professionals to provide instructional services to learners with behavioral and emotional handicaps in an array of settings and requires a total of 36 hours:

Teacher Education Core Courses (9 hours)
EDUC 6100 Theories of Human Development and Learning (3G)
RSCH 6101 Educational Research Methods (3G)
RSCH 6109 Assessment and Evaluation Methods (3G)

Special Education Core Courses (9 hours)
SPED 6100 Introduction to Special Education (3G)
SPED 4270 Classroom Management (3G)
SPED 6130 Diagnostic Instruction (3G)

Specialization Courses (9-12 hours)
SPED 6114 Emotional Handicaps (3G)
SPED 6122 Methods and Materials: Emotional Handicaps (3G)
SPED 6473 Internship: Emotional Handicaps (3-6G)

Elective Courses (6-9 hours)
These courses must be approved by the student's adviser.

Specialization in Cross-Categorical Disabilities

This program prepares educational professionals to provide instructional services to learners with a variety of mild disabilities in cross-categorical and other classrooms and requires a total of 39 hours:

Teacher Education Core Courses (9 hours)
EDUC 6100 Theories of Human Development and Learning (3G)
RSCH 6101 Educational Research Methods (3G)
RSCH 6109 Assessment and Evaluation Methods (3G)

Special Education Core Courses (9 hours)
SPED 6100 Introduction to Special Education (3G)
SPED 4270 Classroom Management (3G)
SPED 6130 Diagnostic Instruction (3G)

Specialization Courses (12-15 hours)
SPED 6123 Methods and Materials: Learning Disabilities (3G)
SPED 6122 Methods and Materials: Emotional Handicaps (3G)
SPED 6116 Career and Vocational Techniques (3G)
SPED 6475 Internship: Mild Handicaps (3-6G)

Elective Courses (6-9 hours)
These courses must be approved by the student's adviser.

Specialization in Learning Disabilities

This program emphasizes multidisciplinary cooperation, prepares educational professionals to provide instructional services to students with learning disabilities, and requires a total of 36 hours:

Teacher Education Core Courses (9 hours)
EDUC 6100 Theories of Human Development and Learning (3G)
RSCH 610I Educational Research Methods (3G)
RSCH 6109 Assessment and Evaluation Methods (3G)

Special Education Core Courses (9 hours)
SPED 6100 Introduction to Special Education (3G)
SPED 4270 CIassroom Management (3G)
SPED 6130 Diagnostic Instruction (3G)

Specialization Courses (9-12 hours)
SPED 6112 Learning Disabilities (3G)
SPED 6123 Methods and Materials: Learning Disabilities (3G)
SPED 6472 Internship: Learning Disabilities (3-6G)

Elective Courses (6-9 hours)
These courses must be approved by the student's adviser.

Specialization in Mental Handicaps

This program prepares educational professionals to work with learners with mild to moderate mental handicaps in an array of settings and requires a total of 36 hours:

Teacher Education Core Courses (9 hours)
EDUC 6100 Theories of Human Development and Learning (3G)
RSCH 6I01 Educational Research Methods (3G)
RSCH 6109 Assessment and Evaluation Methods (3G)

Special Education Core Courses (9 hours)
SPED 6100 Introduction to Special Education (3G)
SPED 4270 Classroom Management (3G)
SPED 6130 Diagnostic Instruction (3G)

Specialization Courses (12-15 hours)
SPED 6113 Mental Handicaps (3G)
SPED 6I21 Methods and Materials: Mental Handicaps (3G)
SPED 6116 Career and Vocational Techniques (3G)
SPED 6474 Internship: Mental Handicaps (3-6G)

Elective Courses (3-6 hours)
These courses must be approved by the student's adviser.

Specialization in Severe and Profound Handicaps

This program prepares educational professionals to work in an array of community-based settings with children and

youth who have severe and profound handicaps and requires a total of 36 hours:

Teacher Education Core Courses (6 hours)
EDUC 6100 Theories of Human Development and Learning (3G)
RSCH 6101 Educational Research Methods (3G)

Special Education Core Courses (9 hours)
SPED 4270 Classroom Management (3G)
SPED 6116 Career and Vocational Techniques (3G)
SPED 6640 Seminar in Special Education: Working with Families (3G) **OR**
CSLG 6200 Introduction to Theories of Family Counseling (3G)

Specialization Courses (15-18 hours)
SPED 6117 Introduction to Persons with Severe Handicaps (3G)
SPED 6126 Methods for Teaching Persons with Severe Handicaps (3G)
SPED 6127 Curriculum for Persons with Severe Handicaps (3G)
SPED 6630 Problems and Issues of Persons with Severe Handicaps (3G)
SPED 6474 Internship: Mental Handicaps (3-6G)

Elective Courses (3-6 hours)
These courses must be approved by the student's adviser.

Specialization in Academically Gifted

This program prepares educational professionals to work in a variety of settings with learners who are academically or intellectually gifted and requires a total of 36 hours:

Teacher Education Core Courses (9 hours)
EDUC 6100 Theories of Human Development and Learning (3G)
RSCH 6101 Educational Research Methods (3G)
RSCH 6109 Assessment and Evaluation Methods (3G)

Special Education Core Courses (6 hours)
SPED 6100 Introduction to Special Education (3G)
SPED 4270 Classroom Management (3G)

Specialization Courses (12-15 hours)
SPED 6111 The Gifted and Talented (3G)
SPED 6124 Methods of Instruction for the Gifted (3G)
SPED 6641 Seminar in Curriculum Development: Gifted and Talented (3G)
SPED 6471 Internship: Gifted and Talented (3-6G)

Elective Courses (6-9 hours)
These courses must be approved by the student's adviser.

GRADUATE CERTIFICATE IN SUPPORTED EMPLOYMENT AND TRANSITION

The Graduate Certificate program in Supported Employment and Transition serves two groups of educational professionals: those who work in adult human service agencies that provide on-the-job training and support *(supported employment)* for individuals with disabilities and those who work in school systems and are responsible for helping students with disabilities prepare to live, work, and learn as adults *(transition from school to adulthood)*.

Program Objectives. As specialists in supported employment and transition for youth who have disabilities, graduates of the program are prepared to: work as job coaches and employment training specialists; provide community-based training for persons with disabilities; and assist students in making the transition from school to adulthood.

Certificate Requirements. The Graduate Certificate program in Supported Employment and Transition requires 12 semester hours, at least six of which must be at the 6000 level. No transfer credit is accepted, although UNC Charlotte "distance learning" courses in Supported Employment and Transition may be applied to meet the program's requirements. Admission to this Graduate Certificate program does not ensure subsequent admission to a graduate degree program in special education. Students must complete the program within four years from the time of enrollment in the first certificate course and earn grades of B or better in each of the courses in the program. The program includes the following core courses and support courses:

Core Courses (6 hours)
SPED 5111 Introduction to Supported Employment (3)(3G) **OR**
SPED 6116 Career and Vocational Techniques (3G)
SPED 5121 Supported Employment Methods (3)(3G)

Support Courses (6 hours)
Two of the following courses:
SPED 5151 Interagency Collaboration (3) (3G)
SPED 6640 Seminar in Special Education: Working with Families (3G)
SPED 6000 Topics in Special Education (3G)
SPED 5111 Introduction to Supported Employment (3)(3G)
SPED 6116 Career and Vocational Techniques (3G)

Reading, Language, and Literacy

Degree: M.Ed. *Coordinator:* Karen Wood
Department: Reading and Elementary Education (REEL)

The M.Ed. program in Reading, Language, and Literacy qualifies graduates for an advanced-level ("G") license in reading education. Relevant to all areas of K-12 curriculum, this program is designed for classroom teachers, reading teachers, literacy specialists, supervisors, assistant principals, and any other school professionals who are interested in improving classroom practices that promote literacy. The content of the program includes attention to recent developments in teaching comprehension; phonics, vocabulary, and study skills; the integration of writing across the curriculum; assessment and remediation of reading and writing difficulties; issues of family literacy; the integration of multicultural literature throughout the curriculum; strategies for supporting at-risk learners; and language development of all students.

Program Objectives. As reading, language, and literacy specialists, graduates of the program are prepared to: promote literacy by improving their own classroom instructional practices; assume the more specialized role of a reading teacher, working primarily with struggling readers and writers;

and work as literacy specialists, helping other teachers improve classroom instructional practices by leading in-service sessions, conducting demonstration lessons, coordinating the literacy curriculum across classrooms and grade levels, and evaluating the effectiveness of instructional strategies, materials, and assessment procedures in reading.

Additional Admission Requirements. In addition to the general requirements for admission to the Graduate School, applicants must hold an "A" level license in any teaching field from the North Carolina Department of Public Instruction (or its equivalent from another state). Applicants who do not have an "A" level license may be conditionally admitted to the program, but they must satisfactorily complete the following 17-21 hours of prerequisite "A" level licensure courses prior to full admission to the program:

EDUC 2100 Introduction to Education and Diversity in Schools (3) **OR**
EDUC 6102 The Person and School in Urban Society (3G)
ELED 3122 Research and Analysis of Teaching Elementary School Learners (3) **OR**
CURR 6110 Research and Analysis of K-12 Teaching (3G)
CURR 6121 Planning for K-12 Instruction (3G)
EIST 4100 Computer Applications in Education (3) (3G)
SPED 2100 Introduction to Students with Special Needs (2) **OR**
SPED 6100 Introduction to Special Education (3G)
READ 6470 Practicum in Reading Instruction (3-6G)

Degree Requirements. The M.Ed. program in Reading, Language, and Literacy requires a total of 36 hours of core courses, curriculum courses, specialization courses, and elective courses:

Core Courses (9 hours)
RSCH 6101 Educational Research Methods (3G)
READ 6250 Language Development and Reading (3G)
SPED 6254 Individualizing Instruction for Regular and Special Needs Students (3G)

Curriculum Courses (9 hours)
READ 6255 Reading and Writing in Content Areas (3G)
READ 5260 Relationship Between Writing and Reading (3G)
READ 5270 Trends and Issues in Reading and Language Arts (3G) **OR**
READ 6000 Topics in Reading, Language, and Literacy (3G)

Specialization Courses (12 hours)
ENGL 6103 The Worlds of Juvenile Literature (3G)
RSCH 6109 Assessment and Evaluation Methods (3G)
READ 6260 Diagnostic Instruction in Reading (3G)
READ 6480 Seminar on K-12 Reading (3G)

Elective Courses (6 hours)
These courses must be approved by the student's adviser.

Capstone Experience. Students must complete either a master's project or a written comprehensive examination. The project may take the form of a thesis, research study, or program development activity. The examination is designed to require synthesis of a student's course work in the program. Both the project and the examination are followed by an oral examination in which the student clarifies, expands, and defends his or her master's project or comprehensive examination.

Teaching English as a Second Language

Degree: M.Ed. *Coordinator:* Eugene Schaffer
Department: Middle, Secondary, and K-12 Education (MDSK)

The M.Ed. program in Teaching English as a Second Language (TESL) qualifies graduates who already hold either an "A" or "G" level teaching license for add-on K-12 licensure to teach English as a second language. In addition to experienced teachers, students in this program also include persons who are not interested in K-12 licensure, but who want to work with non-native English speakers in community colleges, public and private agencies, and multinational corporations.

Program Objectives. As prospective teachers of English as a second language, graduates of the program are prepared to: demonstrate their knowledge of the emotional, psychological, and intellectual implications of learning a second language; identify the communication, cultural, and linguistic aspects essential to learning and teaching English as a second language; analyze and synthesize these components in order to plan appropriate curriculum for students with limited English proficiency; adapt lessons to language minority students, thus increasing their access to and participation in the total curriculum; relate the teaching of English as a second language to current theories of human development and learning; and identify and implement curriculum theories and practices relevant to teaching English as a second language.

Additional Admission Requirements. In addition to the general requirements for admission to the Graduate School, applicants who desire to earn an add-on K-12 license to teach children for whom English is not their native language must hold either an "A" level or "G" level teaching license from the North Carolina Department of Public Instruction (or its equivalent from another state). In addition, applicants from countries where English is not the primary language must score at least 600 on the Test of English as a Foreign Language (TOEFL).

Degree Requirements. The M.Ed. program in Teaching English as a Second Language requires a total of 36 hours of core courses, curriculum courses, specialization courses, and a culminating internship and concurrent seminar:

Core Courses (12 hours)
EDUC 6100 Theories of Human Development and Learning (3G)
ENGL 6161 Introduction to Linguistics (3G)
ENGL 4263 Linguistics and Language Learning (3G)
ENGL 4165 Language and Culture (3G) **OR**
ANTH 4110 American Ethnic Cultures (3G) **OR**
ANTH 4120 Intercultural Communications (3G)

Curriculum Courses (9 hours)
ENGL 4166 Comparative Language Studies for Teachers (3G)
TESL 5101 Second Language Diagnosis and Evaluation (3G)
CURR 6120 Curriculum Theory (3G)

Specialization Courses (9 hours)
TESL 5103 Teaching English as a Second Language (3G)
READ 6250 Language Development and Reading (3G)
RSCH 6101 Educational Research Methods (3G)

Internship and Seminar (6 hours)
TESL 6470 Clinical Experience in Teaching English as a Second Language (3G)
TESL 6476 Seminar and Internship in Teaching English as a Second Language (3G)

Capstone Experience. Students must complete either a master's project or a written comprehensive examination. The project may take the form of a thesis, research study, or program development activity. The examination is designed to require synthesis of a student's course work in the program. Both the project and the examination are followed by an oral examination in which the student clarifies, expands, and defends his or her master's project or comprehensive examination.

Instructional Systems Technology

Degree: M.Ed. *Coordinator:* John Gretes
Department: Educational Administration, Research, and Technology (EART)

The M.Ed. program in Instructional Systems Technology is designed for persons who seek to develop skills for designing and implementing curriculum and instructional strategies that incorporate instructional systems technology. Students in the program include both teachers in public and private schools and persons in the private sector who wish to increase their instructional technology skills. The program qualifies graduates who already hold either an "A" or "G" level teaching license from the North Carolina Department of Public Distribution (or from another state) for an advanced-level ("G") license in Instructional Technology Specialist: Computers.

Program Objectives. As instructional technology specialists, graduates of the program are prepared to: integrate appropriate technology into learning systems; undertake instructional analyses that include task analysis, audience analysis, instructional environment analysis, and both target enabling objectives and measures; identify criteria, strategies, services, and information sources for hardware and courseware evaluation, selection, and integration; plan, develop, revise, and evaluate courseware using a standard planning process and accepted standards and criteria; evaluate instructional technology systems; work effectively as members of a design and development team that generates solutions to instructional problems; and provide leadership in the field of instructional systems technology systems.

Additional Admission Requirements. In addition to the general requirements for admission to the Graduate School, applicants seeking advanced-level ("G") license in Instructional Technology Specialist: Computers must already hold either an "A" or "G" level teaching license from the North Carolina Department of Public Instruction (or from another state).

Degree Requirements. The M.Ed. program in Instructional Systems Technology requires a total of 39 hours of core courses, an instructional development course, related courses, and an internship:

Core I Courses (9 hours)
EDUC 6100 Theories of Human Development and Learning (3G)
RSCH 6101 Educational Research Methods (3G)
EIST 6100 Readings in Instructional Systems Technology (3G)

Core II Courses (9 hours)
EIST 6110 Instructional Design (3G)
EIST 6135 Learning Media, Resources, and Technology (3G)
EIST 6121 Instructional Courseware Authoring (3G)

An Instructional Development Course (6 hours)
EIST 6130 Instructional Development (6G)

Related Courses (9 hours)
These related courses include courses in educational research and evaluation, management and information systems, technical writing, supervision, curriculum and instruction, computer systems, networking, and other topics courses relevant to a student's interests, skills, and needs. Students seeking a "G" license in Instructional Technology Specialist: Computers must include these two courses in their 9 hours of related courses:

ADMN 6120 Instructional Leadership (3G)
ADMN 6130 Supervision of Instruction (3G)

All related courses must be approved by the student's adviser.

Internship (6 hours)
EIST 6491 Seminar and Internship in Instructional Systems Technology (6G)

Capstone Experience. Students must complete either a master's project or a written comprehensive examination. The project may take the form of a thesis, research study, or program development activity. The examination is designed to require synthesis of a student's course work in the program. Both the project and the examination are followed by an oral examination in which the student clarifies, expands, and defends his or her master's project or comprehensive examination.

Counseling

Degree: M.A. *Coordinator:* Mary Thomas Burke
Department: Counseling, Special Education, and Child Development (CSPC)

The M.A. program in Counseling is accredited by the Council for Accreditation of Counseling and Related Educational Programs (CACREP) in both school counseling and community counseling. Both specializations qualify graduates for certification as practicing counselors in North Carolina and for certification eligibility by the National Board of Certified Counselors. The school counseling specialization includes options in both elementary and secondary school counseling, and it qualifies graduates for an advanced-level ("G") license in K-12 counseling in North Carolina.

Program Objectives. As prospective professional counselors, graduates of the program are prepared to: counsel clients, both individually and in groups, on educational, career, life planning, social, emotional, physical, spiritual, and organizational concerns; provide information to clients for educational, social, career, and/or life planning; consult with other professionals concerning client needs; and conduct needs assessments, evaluations, and other activities for program design.

Additional Admission Requirements. In addition to the general requirements for admission to the Graduate School, the criteria for admission to the M.A. program in Counseling include an applicant's potential success in forming effective interpersonal relationships in individual and small-group contexts; aptitude for graduate-level study; vocational goals and objectives; openness to self-examination; and potential for personal and professional self-development. Admission decisions are based on applicants' individual profiles and made by a committee of program faculty. Applicants with the highest profile rankings are invited to campus for a day-long interview process; the number invited is determined by the number of anticipated openings in the program. Students are admitted to the program in the spring of each year, and they are expected to begin their studies the following fall. The application deadline for each year's admissions process is January 15.

Degree Requirements: The M.A. program in Counseling requires a total of 60 hours of core courses for all students and specialization courses for students in either *school counseling* or *community counseling*. Both specializations include a series of required courses, clinical experience courses, cognate courses, and elective courses.

Core Courses for All Students (33 hours)

EDUC 6100	Theories of Human Development and Learning (3G)
RSCH 6109	Assessment and Evaluation Methods (3G)
CSLG 6100	Counseling Theory (3G)
CSLG 6101	Ethical and Professional Issues in Counseling (3G)
CSLG 6109	Research in Counseling (3G)
CSLG 6110	Counseling Techniques (3G)
CSLG 6111	Advanced Counseling Techniques (3G)
CSLG 6120	Group Counseling (3G)
CSLG 6121	The Leadership and Design of Structured Groups (3G)
CSLG 6145	Multicultural Counseling (3G)
CSLG 6150	Career and Lifestyle Development (3G)

School Counseling Specialization Courses (27 hours)
Required Course (3 hours)

CSLG 7140	Elementary School Counseling and Guidance (3G) **OR**
CSLG 7141	The Secondary School Counselor (3G)

Clinical Experience Courses (9 hours)
Two of the three courses must be in a school setting:

CSLG 7430	Practicum in Counseling and Guidance (3G)
CSLG 7435	Internship (3G)
CSLG 7436	Advanced Internship (3G)

Cognate Courses (9 hours)
Three courses selected from the following:

ADMN 6105	Legal Aspects of Schooling (3G)
ADMN 6107	School Law for Counselors and Related Professionals (3G)
SOCY 4631	Seminar in Family Violence (3G)
SOCY 4632	Changing American Family (3G)
SPED 6100	Introduction to Special Education (3G)
SPED 6112	Learning Disabilities (3G)
CJUS 6160	Juvenile Justice Systems (3G)

Elective Courses (6 hours)
These courses must be approved by the student's adviser.

Community Counseling Specialization Courses (27 hours)
Required Courses (6 hours)

CSLG 7170	Community Counseling and Management (3G)
PSYC 6153	Classification of Psychological Dysfunctions (3G)

Clinical Experience Courses (9 hours)
Two of the three courses must be in a community setting:

CSLG 7430	Practicum in Counseling and Guidance (3G)
CSLG 7435	Internship (3G)
CSLG 7436	Advanced Internship (3G)

Cognate Courses (6 hours)
Two courses selected from the following:

CSLG 5100	Counseling Needs of Women (3G)
CSLG 6000A	Counseling Persons with HIV (3G)
CSLG 6000C	Crisis Intervention (3G)
CSLG 6000X	Substance Abuse Counseling (3G)
CSLG 6000Y	Group Counseling - Addictive Behavior (3G)
CSLG 6200	Introduction to Theories of Family Counseling (3G)
SOCY 4110	Sociology of Aging (3G)
SOCY 4130	Sociology of Health and Illness (3G)
SOCY 4163	Sociology of Sex Roles (3G)
SOCY 4172	Sociology of Deviant Behavior (3G)
SOCY 4632	Changing American Family (3G)
CJUS 6100	The Criminal Justice System (3G)

Elective Courses (6 hours)
These courses must be approved by the student's adviser.

Admission to Candidacy. In addition to meeting Graduate School academic regulations, counseling students should submit a completed Application for Admission to Candidacy when they submit their application for the program's capstone experience to the Department of Counseling, Special Education, and Child Development.

Capstone Experience. Students must successfully complete either a written comprehensive examination or a master's project near the end of their program of study. Students are expected to consult with their advisers during the first 24 hours of course work concerning procedures and preparation for this capstone experience.

Educational Administration

Degrees: M.S.A.; Ed.D. *Coordinator:* James Lyons
Department: Educational Administration, Research, and Technology (EART)

MASTER OF SCHOOL ADMINISTRATION

The Master of School Administration (M.S.A). program is designed to prepare individuals who can serve as building principals and curriculum and instructional specialists in K-12 schools. This program qualifies graduates for both a Level I license as a K-12 School Administrator: Principal and a Level I license as a K-12 Curriculum Instructional Specialist: Supervisor.

Program Objectives. As prospective school principals, graduates of the program are prepared to: demonstrate an understanding of the purpose, mission, goals, objectives, and operating procedures of schools; plan educational programs and activities; acquire and manage resources for instruction in a school; assess educational programs and personnel; facilitate group cohesiveness, staff cooperation and motivation, problem-solving, decision-making, and the resolution of organizational, group, and individual conflict; exercise collaborative leadership in working with diverse groups and representing staff, students, parents, school officials, and the public; improve staff members' work experiences, enhance their self-confidence, and contribute to their professional development; deal with the dynamics of change, including timing, direction, strategies, and preparation of an organization and its staff; and demonstrate an understanding of how legal, social, economic, technological, and political environments affect schools and the education of children.

Additional Admission Requirements. In addition to the general requirements for admission to the Graduate School, applicants must submit a personal statement of purpose, a description of previous relevant employment (including evidence of at least three years of successful teaching and evidence of leadership exercised while serving as a teacher), and recommendations from school administrators.

Admission decisions are based on a comparison of applicant profiles and are made by a program admissions committee that includes program faculty, the chair of the department, and one or more of the program's clinical instructors. Applicants with the highest profile rankings are invited to participate in interviews that are conducted by program faculty and designed to provide evidence of an applicant's academic strength, leadership potential, and personal characteristics. Admission decisions are based not only on the comparative profiles of all applicants, but also on the commitment of program faculty to achieve diversity among the students admitted in each year's cohort group. Admission decisions are made in the spring, with the expectation that admitted students will begin their course work the following summer or fall.

Degree Requirements. The M.S.A. program requires a total of 48 hours of core courses, educational administration courses, and cognate courses outside the College of Education:

Core Courses (6 hours)

RSCH 6101	Educational Research Methods (3G)
EDUC 6102	Person in School and Urban Society (3G) **OR**
EDUC 6100	Theories of Human Development and Learning (3G)

Educational Administration Courses (36 hours)

ADMN 6100	Fundamentals of Educational Leadership (3G)
ADMN 6105	Legal Aspects of Schooling (3G)
ADMN 6110	School Leadership and Management (3G)
ADMN 6120	Instructional Leadership (3G)
ADMN 6130	Supervision of Instruction (3G)
ADMN 6140	Curriculum Leadership (3G)
ADMN 6410	Internship and Seminar Part I (9G)
ADMN 6420	Internship and Seminar Part II (9G)

Cognate Courses (6 hours)
These courses must be approved by the student's adviser.

Capstone Experiences. Students must complete both a comprehensive examination and a major project. On the examination, students must demonstrate that they have developed a thorough and well-integrated understanding of both the basic principles, research findings, and theories covered in their course work and specific strategies for applying these principles, findings, and theories to educational practice and leadership at the school level. The culminating project grows out of the student's internship and is collaboratively planned by the student, program faculty, and the building principal who supervised the student's internship. The student must prepare a detailed written description of the project and defend it orally before a faculty committee and fellow interns in the program.

Principal Fellows. Each year a limited number of scholarship/loans for persons seeking an M.S.A. as full-time students are available from the North Carolina Principal Fellows Program. Funded by the North Carolina General Assembly to help highly qualified persons study school administration on a full-time basis, the program provides $40,000 over a two-year period and requires repayment with either four years of service as a school administrator in a North Carolina public school or monetary reimbursement of the original loan, plus interest.

In the spring of each year, the North Carolina Principal Fellows Commission selects new Principal Fellows from applications received prior to March 1. To be eligible for consideration, an applicant must provide evidence of at least three years of successful teaching experience (or equivalent experience), at least a 3.2 grade point average in his or her last 60 hours of college-level study, and unconditional admission as a full-time student in one of the state's M.S.A. programs. Additional admission criteria and procedures are described in an application packet that can be obtained from the North Carolina Principal Fellows Program. Current information about the program is available in the department office.

DOCTOR OF EDUCATIONAL LEADERSHIP

The Ed.D. program in Educational Leadership is designed to prepare educational administrators who can assume mid-level and senior-level leadership positions in pre-collegiate educational settings, particularly in the public school systems of North Carolina and its southern Piedmont region.

The program requires 60 hours beyond the master's degree and builds on the Master of School Administration (M.S.A.) and comparable programs. Upon successful completion of course work and a qualifying examination, and prior to the doctoral internship and dissertation proposal, Ed.D. students receive a Certificate of Advanced Study (C.A.S.) in educational administration, which qualifies them for North Carolina licensure as school superintendents. Upon completion of all requirements for the Ed.D. in Educational Leadership, students are qualified for the Level III (doctorate) School Administrator license in North Carolina.

Program Objectives. As prospective superintendents and other mid- and senior-level school administrators, graduates of the program are prepared to: exhibit a broad and systematic understanding of professional education; demonstrate leadership competencies and skills necessary to accomplish the goals of complex organizations; interact successfully with the numerous institutions and interests that influence education and the complex milieu in which schools operate; administer high-quality programs in schools and school districts; understand theoretical concepts that undergird organizational theory and behavior, leadership, social psychology, policy development, and organizational change; address basic issues that face educational leaders, including resource acquisition and management, policy development and analysis, program development and evaluation, staff selection and appraisal, school-community relations, and curriculum development and instruction; conduct research on problems and needs facing schools today and apply research findings in an informed and critical manner; and understand, appreciate, and behave consistently with ethical codes of conduct that are relevant to educational leaders in today's elementary, middle, and secondary schools.

Additional Admission Requirements. In addition to the general requirements for admission to the Graduate School, applicants must have a master's degree in school administration, educational administration, or a closely related field; an entry-level license in educational administration or supervision; and a minimum of three years of successful administrative experience in schools. Applicants must also submit a personal essay of purpose; a description of their previous relevant employment, including especially their administrative experience in schools; and recommendations from school administrators and former university instructors.

Admission decisions are based on a comparison of applicant profiles and are made by a program admissions committee that includes program faculty, the chair of the department, and one or more of the program's clinical instructors. Applicants with the highest profile rankings are invited to participate in interviews that are conducted by program faculty and designed to provide evidence of an applicant's academic strength, leadership potential, and personal characteristics. Admission decisions are based not only on the comparative profiles of all applicants, but also on the commitment of program faculty to achieve diversity among the students admitted in each year's cohort group. Admission decisions are made in the spring, with the expectation that admitted students will begin their course work the following summer or fall.

Degree Requirements. The Ed.D. program in Educational Leadership requires a total of 60 hours of educational administration courses, research courses, and cognate courses outside the College of Education. Students must also complete a residency of at least two successive terms of full-time enrollment, a year-long administrative internship in a K-12 school district, and a doctoral dissertation research study.

Educational Administration Courses (30 hours)

CURR 7122	Advanced Curriculum Theory (3G)
ADMN 7110	Organizational Theory and Behavior (3G)
ADMN 7120	Advanced School Law (3G)
ADMN 7130	Educational Governance and Policy Studies (3G)
ADMN 7140	School Finance (3G)
ADMN 7150	Human Resources Development and Administration (3G)
ADMN 7410	Advanced Internship in Educational Leadership Part I (3G)
ADMN 7420	Advanced Internship in Educational Leadership Part II (3G)
ADMN 7610	Interdisciplinary Seminar (1G) (3 hours required)
ADMN 7660	Instructional Leadership Seminar (3G)

Research Courses (18 hours)

RSCH 6110	Descriptive and Inferential Statistics in Education (3G) **OR**
RSCH 6120	Advanced Educational Statistics (3G) **OR**
RSCH 6130	Presentation and Computer Analysis of Educational Research Data (3G) **OR**
RSCH 7120	Multivariate Statistics (3G)
RSCH 7110	Applied Educational Research (3G)
RSCH 7111	Qualitative Research Methods in Education (3G) **OR**
RSCH 7112	Survey Research Methods in Education (3G) **OR**
RSCH 7113	Single Subject Research Methods in Education (3G) **OR**
RSCH 7196	Program Evaluation Research Methods in Education (3G)
ADMN 8699	Dissertation Proposal Seminar (3G)
ADMN 8999	Dissertation Research (3G) (6 hours required)

Cognate Courses (12 hours)
These courses must be approved by the student's adviser.

Capstone Experiences. Students must complete and defend a dissertation focused on a specific problem or question relevant to K-12 educational organizations, administration, or leadership. Students must be continually enrolled for dissertation research credit, beginning with the semester following approval of their dissertation research proposal and continuing through the semester of their graduation. Their enrollment for dissertation research credit must total at least 6 hours. Defense of their dissertation is conducted in a final oral examination that is open to members of the University community.

Engineering

Degrees: M.S.C.E., M.S.E.E., M.S.M.E., M.S.E., M.E.; Ph.D.; other doctoral studies in cooperation with North Carolina State University

Civil Engineering Coordinator: Jy S. Wu
Electrical Engineering Coordinator: Rafic Makki
Mechanical Engineering Coordinator: Jay Raja

MASTER'S PROGRAMS

The William States Lee College of Engineering offers Master of Science in Civil Engineering (M.S.C.E.), Master of Science in Electrical Engineering (M.S.E.E.), Master of Science in Mechanical Engineering (M.S.M.E.), Master of Science in Engineering (M.S.E.) and Master of Engineering (M.E.) degrees. These provide an opportunity for graduate-level engineering education to improve on-the-job skills, to provide for career development, and/or to provide a foundation for additional graduate study. The master's programs can be of an applied, theoretical and/or professional nature and offer sufficient flexibility for the inclusion of management, communications and other subjects appropriate for total career development.

Entry into the M.S.C.E., M.S.E.E. or M.S.M.E. program requires a baccalaureate degree in civil, electrical or mechanical engineering, respectively. The M.S.E. degree offers a more generic program of study to students who may not possess a baccalaureate degree in engineering. To enter the M.S.E. program, applicants must present evidence of satisfactory undergraduate preparation in engineering or a closely allied area such as physics, chemistry, or biology.

Qualified students may apply for early entry into a graduate program during their junior or senior years. For information on this early-entry program, see the Graduate Section of this *Catalog*.

The M.E. program is an off-campus program designed to provide engineers working in industries throughout North Carolina an opportunity to improve job-related skills and to participate in graduate education while remaining on the job site. A cooperative venture among the three UNC engineering schools (North Carolina State University, North Carolina A&T State University and UNC Charlotte), the M.E. program can be made available on site to all qualified engineers in the state through the use of video-based presentations (video taped courses) and telecommunications. This non-residency, non-thesis program emphasizes the practical application of engineering theory and design to industrial problems. Possession of a bachelor's degree, or its equivalent, from an accredited college or university is the primary requisite for admission to the M.E. program.

Additional Requirements for Acceptance into the Master's Degree Programs in Engineering. In addition to the general requirements for admission to the Graduate School, the following are required for study in Engineering:

1. Applicants must demonstrate evidence of satisfactory undergraduate preparation in engineering, usually manifested by the possession of a baccalaureate degree from an accredited institution in some area of engineering, with a grade point average of at least 3.0 on a 4.0 scale. Special consideration may be given to candidates with substantial engineering work experience.
2. Applicants with baccalaureate degrees from fields other than engineering (e.g., engineering physics, chemistry, mathematics, etc.) may be considered for admission to graduate study on a conditional basis. Such applicants must remove deficiencies in their engineering background delineated by the department of engineering in which they will pursue their major area of study.
3. All conditional admissions must be approved by the Dean of the College of Engineering. Evaluations of conditionally admitted students after completion of 12 hours of graduate work also must be approved by the Dean, as are requests for readmission.
4. The applicant must receive a satisfactory score on the Aptitude Portion of the Graduate Record Examination.
5. Acceptability for admission is based upon the applicant's records and background as determined by the department in which the applicant will pursue his or her major area of study. The department has the prerogative to accept the applicant without reservation, to accept the applicant with conditions, or to deny the applicant. Any conditions are to be clearly stated and agreed to by the applicant before admission is completed.

M.S.C.E., M.S.E.E., M.S.M.E., AND M.S.E. DEGREE REQUIREMENTS

1. The satisfactory completion of a minimum of at least 30 approved graduate credit hours as prescribed by the student's department and program committee and fulfilling the following:

   A minimum of 18 semester hours in a major area of engineering, no more than six of which can be for a research thesis; or, alternatively, no more than three of which can be for a special problem report; or a design project. The decision as to whether a program will include a thesis, design project or problem report is to be made on an individual basis at the time of filing the student's Plan of Study.

   A minimum of 12 semester hours of approved electives. In order to broaden the student's exposure to subject matter and faculty expertise, at least six of these elective hours must be in mathematics, science or another engineering department. Inclusion of business and/or communications courses is permitted.

2. At least 18 of the required 30 semester hours must be in courses at the 6000-level or above.

3. *Academic Standards:* Only the grades of *A*, *B* or *C* are accepted toward a graduate degree. A grade of *U* in any graduate course will terminate the student's enrollment subject to readmission as prescribed in the University *Catalog*. Similarly, an accumulation of three *C* grades will result in termination of the student's enrollment, subject to readmission to a program. A student in any graduate program is required to maintain satisfactory progress toward the degree. Continued enrollment is at all times subject to review on the basis of academic record and of actions with regard to observance of University rules and regulations.

   Students admitted to full standing will normally be permitted to re-enroll in successive terms, subject to

satisfactory performance on coursework and to load limitation imposed by their employers and the University. However, they must complete formal registration within the designated registration period. A student admitted conditionally will be permitted to continue, subject to satisfactory academic performance, until he or she has attempted 12 semester hours of graduate coursework, at which time admission status will be reviewed by the major department. Subsequently, the student will be advised as to his or her eligibility to continue.

To qualify for a degree, the student must have a grade point average of at least 3.0 based upon all courses acceptable for graduate credit for which he or she received a grade from the University.

4. Transfer and residence credit are to be in accordance with University regulations.

5. All work offered for the master's degrees must be completed within a six-year period.

M.E. DEGREE

1. The satisfactory completion of at least 30 graduate credit hours including at least 18 hours in a major area of engineering and at least 12 hours of approved electives.

2. At least 18 of the required minimum of 30 semester hours must be at the 6000-level.

3. *Academic Standards:* Only the grades of *A*, *B*, or *C* are accepted toward the M.E. degree. A grade of *U* in any course will terminate the student's enrollment in the M.E. program subject to readmission as prescribed in the University *Catalog*. Similarly, an accumulation of three *C* grades will result in termination of the student's enrollment, subject to readmission to the program. A student in any graduate program is required to maintain satisfactory progress toward the degree. Continued enrollment is at all times subject to review on the basis of academic record and of actions with regard to observance of University rules and regulations.

   To qualify for the M.E. degree, the student must have a GPA of at least 3.0 based on all courses acceptable for graduate credit for which he or she received a grade from any of the participating universities.

4. *Transfer Credit.* Courses taken at any of the participating institutions are considered part of the program and are not treated as transfer courses. At the time of admission, up to six hours of transfer credit may be accepted from an ABET accredited engineering institution.

5. All courses offered for the Master of Engineering degree must be completed within 10 years.

Plan of Study. After completing at least nine, but no more than 18, semester hours of graduate study, the student must file a *Plan of Study*. This plan is formulated by the student with the advice and consent of his or her Graduate Program Adviser and the student's Program Committee and submitted for approval to the major department and the College's Engineering Graduate Committee (EGC). This plan is to indicate all coursework and any other requirements (thesis, project problems, deficiencies, etc.) which the student is expected to fulfill satisfactorily before the awarding of the master's degree.

Relatively minor changes in an approved Plan of Study (e.g., change in a date for when a course is to be taken, or a direct substitution of one course for another course *in the same area*) may be made at the discretion of the student's adviser and Program Committee, although such changes shall be so indicated in the student's Admission to Candidacy.

However, significant changes such as a change of adviser, change of research topic, change of minor area, etc., shall be submitted immediately to the EGC for its review to ensure that such changes conform to the existing guidelines for the specific program.

Student's Program Committee. Each student's Program Committee shall be composed of not less than three members of the graduate faculty, *one of whom shall be from a department other than the student's major*, with the Graduate Program Adviser serving as chair of the committee. The committee is recommended by the department after appropriate consultation between the adviser and student, and is subject to approval by the EGC at the time of submission of the Plan of Study.

If the student is to pursue an industrially oriented design project through an internship in a local industrial or governmental organization, the person supervising the internship project shall be added to the Program Committee upon approval of the project by the student's Program Committee.

The functions of the student's Program Committee are to participate in planning the student's program, evaluate his or her academic progress and make appropriate recommendations, evaluate the student's research thesis or design project, administer the comprehensive final examination, and, finally, make the recommendation as to the candidate's qualifications for the degree.

Admission to Candidacy. Upon completion of a substantial amount of graduate work and in no case later than two weeks prior to the beginning of the semester in which the student expects to complete all requisites for the degree, the student shall file for Admission to Candidacy on a form supplied by the Graduate School. This application is a checklist approved by the adviser, department chair, and the College Dean listing all coursework to be offered for the degree (including transfer credit and courses in progress). A tentative or, if possible, actual date for the comprehensive examination should be agreed upon and indicated on this application. The date should be realistic and allow ample time for completion and review of the thesis or project.

Comprehensive Examination. Upon completion (or near completion) of all degree requirements as indicated in the Admission to Candidacy, the candidate shall stand for a final comprehensive examination(s). This examination(s) (written, oral or both) is to be set and administered by the student's Program Committee and is to cover those areas of study and/or research as deemed appropriate by the Committee.

The result of this examination and the Committee's recommendation as to the candidate's qualifications for the degree shall be transmitted to the Graduate School Office through the College of Engineering.

Assistantships. A number of graduate teaching and research assistantships are available each year. These assistantships are

awarded on a competitive basis. Further information is available from the individual departments.

DOCTOR OF PHILOSOPHY (Ph.D.) DEGREE

UNC Charlotte offers multidisciplinary programs leading to the Ph.D. degree in Electrical Engineering and in Mechanical Engineering. The doctoral program in Electrical Engineering is focused in the multidisciplinary areas of microelectronics, optoelectronics and computer engineering. The program in Mechanical Engineering is focused in the multi-disciplinary areas of computer integrated manufacturing, materials, and precision engineering.

Additional Admission Requirements. In addition to the general requirements for admission to the Graduate School, the following are required for study toward the Ph.D. programs in Electrical Engineering and Mechanical Engineering:

1. A master's degree in engineering or a closely allied field with a GPA of at least 3.5. Students with only a baccalaureate degree may be admitted on a conditional basis, with an overall GPA of at least 3.2, but will not be formally admitted to the Ph.D. program until completion of the requirements for a master's degree.
2. An acceptable score on the verbal and quantitative sections of the Graduate Record Examination General Test.
3. Three letters of reference, at least two of which must be from faculty members. All three must be from professionals working in the applicant's field of interest.

Degree Requirements. The following is a chronologically ordered set of requirements for the Ph.D. degree in Electrical Engineering and in Mechanical Engineering:

1. Appointment of a Ph.D. advisor and formation of an advisory committee.
2. Development of a Ph.D. Plan of Study detailing all course and examination requirements.
3. Successful completion of the written qualifying examination.
4. Presentation of a proposal for Ph.D. research and admission to candidacy.
5. Successful defense of the Ph.D. Dissertation.

Within the first semester of being admitted into a Ph.D. program, the student should choose a Ph.D. adviser and form an advisory committee. In conjunction with the Ph.D. adviser and this advisory committee, the student will develop a Plan of Study to meet the Ph.D. program requirements of course work and examinations and prepare to undertake original research leading to a dissertation of a quality that would be acceptable for publication of articles in peer-refereed professional journals.

Plan of Study. The Plan of Study will include at least 45 hours of formal course work beyond the baccalaureate degree and at least 18 hours of research/dissertation credits. For students who do not possess appropriate bachelor's and/or master's degrees in engineering, additional course work will be expected. The specific course requirements will be set by the student's Advisory Committee but must include:

1. At least 30 hours within the major field of study, no less than 18 of which must be in courses at the 6000-level or above open only to graduate students.

2. Two minors consisting of at least 6 hours each in related fields of study. For mechanical engineering students, one of these minors must consist of 9 hours of mathematics.

The Plan of Study must be submitted to the Chair of the Department for review and approval within the second semester after admission to the Ph.D. program.

Graduate Only Courses. At least 18 hours in the major field must be in courses at the 6000-level or higher. At least 12 of those hours must be taken after admission to the Ph.D. program. Course work beyond the 18 hours may be at a lower level and courses taken in the related subject areas may be at the 5000 level.

Grades. A student is expected to achieve A's or B's in all course work taken for graduate credit and must have a GPA of at least a 3.0 in order to graduate. The dissertation is graded on a Pass/Unsatisfactory basis and, therefore, will not be included in the cumulative average. An accumulation of more than two marginal (C) grades will result in termination of the student's enrollment in the graduate program. If a student makes a grade of *U* on any course, enrollment will be terminated. A graduate student whose enrollment has been terminated because of grades is ineligible to attend any semester or summer session unless properly readmitted to the graduate program. Readmission to the program requires approval of the Dean of the Graduate School upon the recommendation of the student's major department and the Engineering Doctoral Graduate Committee of the College of Engineering.

Transfer Credit. See "Doctoral Degree Requirements" in this *Catalog* for a discussion of transferred credit.

Residence. A student may satisfy the residency requirement for the program by completing 18 hours, either course work or research credits, by study-in-residence during the academic year and during the summer terms, as long as the study is continuous. Study-in-residence is deemed to be continuous if the student is enrolled in one or more courses (including research/ dissertation credit) in successive semesters until eighteen hours of credit are earned.

Qualifying Examination. In addition to demonstrating a high level of competence in course work, the student must pass a comprehensive written qualifying examination in the major and minor areas. The qualifying examination should be taken before completion of 18 hours beyond the master's degree in the major and minor areas but must be passed no later than one year after initial admission to the program. Failure to pass the qualifying examination in two tries will result in the termination of the student's enrollment in the Ph.D. program.

Dissertation Proposal and Admission to Candidacy. Because the Ph.D. program is heavily based on independent research, each student must write a proposal describing his/her proposed dissertation research following the technical guidelines established by the department. The proposal must be presented to and orally defended before the student's advisory committee. The proposal must be presented within one year after the qualifying examination is passed. Upon approval of the student's

dissertation proposal, the advisory committee will recommend the student's admission to candidacy subject to the approval of the Engineering Doctoral Graduate Committee and the Dean of the Graduate School.

Dissertation. Evidence of a high degree of competence in scholarship, written exposition, independent inquiry and the ability to organize and apply knowledge must be demonstrated by the student in the dissertation. The student will make a public defense of the dissertation at which time the dissertation, as well as the student's knowledge of the field, will be appropriate matter for examination by the student's advisory committee. Although questions may be asked by the general audience, evaluation of the dissertation defense is the sole responsibility of the advisory committee. The dissertation will be graded on a Pass/Unsatisfactory basis.

Research Tool Requirements. Each student is expected to develop a working knowledge of the library tools used in literature search and review in the major field of concentration. This would include familiarity with at least one of the computer-based databases available at UNC Charlotte. In addition, each student is expected to have a working knowledge of at least one computer language appropriate for the field of inquiry. The student will have a working knowledge of appropriate major software packages and will have the ability to develop original software as needed.

Time Limit. Students are allowed a maximum of eight (8) calendar years from formal admission to the Ph.D. program to complete the program successfully.

COOPERATIVE PH.D. PROGRAM IN ENGINEERING

The College of Engineering at UNC Charlotte has a cooperative arrangement with North Carolina State University (NCSU) to provide Ph.D. degree candidates located in Charlotte and enrolled in the Ph.D. program at NCSU with the opportunity to carry out most of their course work and dissertation research at UNC Charlotte. In addition to courses available at UNC Charlotte, selected doctoral-level courses from other participating institutions are available via the NC-REN telecommunications network.

Admission. Requirements for admission to the cooperative Ph.D. program are:

1. The student must have previously earned a master's degree in engineering at UNC Charlotte or another accredited university.
2. The student must be accepted by a department in the UNC Charlotte College of Engineering.
3. The student must be accepted by the UNC Charlotte Graduate School.
4. The student's academic interests must parallel those of a UNC Charlotte faculty member who has been appointed to the NCSU graduate faculty or who is deemed eligible for such appointment.
5. The student must be sponsored and recommended for admission to the NCSU Ph.D. program by the department in which he or she has been accepted at UNC Charlotte. The student must be accepted by the NCSU Graduate School and the corresponding engineering department at NCSU. This acceptance by both UNCC and NCSU constitutes admission to the Ph.D. program which normally should be completed within the second semester of work beyond the master's degree.

Degree Requirements. The degree of Doctor of Philosophy is to be awarded by NCSU to students who have accrued expanded knowledge beyond the master's degree and have demonstrated the capability to undertake and accomplish significant research in a specialty area with a minimum of supervision. The specific degree requirements are available from the appropriate department at North Carolina State University.

English

Degree: M.A.
Graduate Certificate

Coordinator: Frederik N. Smith

MASTER OF ARTS DEGREE IN ENGLISH

The master's program in English is designed to accommodate students seeking a Master of Arts degree with or without graduate licensure in teaching. Flexible enough to meet the needs of the individual, the program can serve: those seeking personal enrichment through increased knowledge and understanding; those preparing to pursue a Ph.D. in English or other advanced professional degrees; and those seeking professional advancement in such fields as writing, publishing, or teaching on the primary, secondary, or college levels. The Department offers a broad range of courses in literature, writing/rhetoric, and language, including second language studies. Students interested in licensure to teach English as a second language in K-12 settings should refer to the M.Ed. Program in Teaching English as a Second Language in the Department of Middle, Secondary, and K-12 Education. For more particular information than that given below, students may request a copy of the "Graduate Student Handbook" from the Department.

Additional Admission Requirements. In addition to the general requirements for admission to the Graduate School, the following are required for study in English:

1. Thirty hours of undergraduate coursework in English beyond the freshman level, or evidence of equivalent academic preparation for graduate study in English, as approved by the Department.
2. A satisfactory score on the Aptitude portion of the Graduate Record Examination or on the Miller Analogies Test.

Degree Requirements. The program requires a minimum of 36 semester hours of graduate credit with grades of *A* or *B*. (A course in which a student receives a grade of *C* is not allowable as part of the 36 required hours.) Eighteen semester hours must be in English courses at the 6000-level, open only to graduate students. A student must choose one of four tracks: literature, writing/rhetoric, language, or general. A thesis option (see course description for ENGL 6996) and a non-thesis option are both available; the thesis may be in creative writing.

Of the 36 hours of graduate credit, 30 must be in English courses; the remaining 6 hours may be taken in English or in another discipline. If the hours are to be taken outside of English, the student must submit a written request to the

Coordinator of Graduate Studies, explaining how these hours will enrich his/her program.

Students who have an "A" teacher's license may obtain a "G" license at the completion of the degree by taking 6 of their 36 graduate hours in Education. Also, graduate courses in English may be applied toward subject matter requirements for an "A" license, but courses so used may not also be applied toward subject matter requirements for a "G" license.

No more than 6 hours of ENGL 6890 (Directed Reading), may be applied to the degree without written permission of the Chair of the Department.

All M.A. candidates, regardless of which emphasis is chosen, are required to take ENGL 6101 (Introduction to English Studies) and ENGL 6160 (Introduction to the Englisb Language). Following are descriptions of the four tracks.

The literature track includes five literature courses, at least three of which are historically oriented. Two of these courses must be in one national literature and the third in a different national literature. In addition, one writing/rhetoric course, one literary theory-intensive course, and three electives are required. At least one course *must* be a designated seminar.

The writing track includes four writing/rhetoric courses, one writing/rhetoric theory-intensive course, two literature courses, and three electives. At least one course *must* be a designated seminar. The writing track may focus on creative writing, technical/professional writing, or writing and pedagogy.

The general track includes one theory-intensive course, two writing/rhetoric courses, two literature courses, and five electives. At least one course *must* be a designated seminar.

The English language studies track includes two writing/rhetoric courses, two literature courses, and four courses selected from the following:

ENGL 4161	Modern Grammar
ENGL 4165	Language and Culture
ENGL 4166	Comparative Language Studies for Teachers
ENGL 4260	History of the English Language **or:**
ENGL 6162	History of the English Language
ENGL 4263	Linguistics and Language Learning **or:**
ENGL 6163	Language Acquisition
ENGL 6161	Introduction to Linguistics
ENGL 6070	Topics in English (Approval of Graduate Coordinator required)

In addition, students will choose one course from the following:

ENGL 4254	Teaching English/Communications Skills To Middle and Secondary School Learners
ENGL 4400	English Composition Practicum
ENGL 4264	Literacy in Community/Family
ENGL 6195	Teaching College English

Depending on individual goals and the quality of their undergraduate preparation, students may choose to substitute a course from outside the Department such as: TESL 5101 (Second Language Diagnosis and Evaluation); FORL 4200 (Secondary Methods--Foreign Languages); or ANTH 4120 (Intercultural Communications).

Courses beyond 36 hours of graduate credit may be required to remove deficiencies or to satisfy requirements for graduate licensure, or may be recommended to develop areas of need, to pursue particular interests, or to gain specific experience.

Comprehensive Examination. Students entering in Fall 1995 and after must satisfactorily complete a written examination for their chosen track. The examination will be based primarily on a reading list available from the Department well in advance. The written examination may not be attempted sooner than the last semester of coursework, exclusive of thesis credits.

Assistantships. A number of graduate assistantships are available each year. In order to be fully competitive, applications must be submitted by March 15. Further information is available in the Department.

Internships. The Department of English offers a number of internships for graduate students (limited to 3 hours credit), which provide program-related experience in local television and radio stations, non-profit and government agencies, and local businesses and corporations. Further information is available in the Department.

Loan Fund. The Anne R. Newman Graduate Student Loan Fund makes emergency money available to graduate students for the semester's tuition, fees and books, or other expenses related to the pursuit of an M.A. in English. Further information is available in the Department.

GRADUATE CERTIFICATE IN ENGLISH LANGUAGE STUDIES

The Graduate Certificate Program in English Language Studies enables professionals to focus and solidify or update their work with language teaching and research applications. As technology-supported applications of language theory increase, and as teaching and research opportunities change in response to demographic and educational demands, both in the U.S. and in the global community, this Certificate grounds the participants in both current theory and practice and makes courses in the English Language Studies Concentration available to persons with related degrees and professional aspirations.

Admission Requirements. Students are admitted to the Graduate School in a special category for certificate programs. See general information on admission to graduate certificate programs elsewhere in this *Catalog*.

Certificate Requirements. The Graduate Certificate in English Language Studies requires 12 hours in approved courses, including at least 6 hours at the 6000-level. A typical program might include four courses from the following: ENGL 4161 (Modern English Grammar), ENGL 4165 (Language and Culture), ENGL 6161 (Introduction to Linguistics), ENGL 6163 (Language Acquisition), ENGL 6195 (Teaching College English). Students must earn a grade of "B" or better in all courses presented for the certificate, and must complete the program within four years from the time of first enrollment in a certificate course.

It is expected that students will structure their program to gain a concentration in theory and content either of applied linguistics or second-language. Substitutions from the broader emphasis and program will be allowed with approval of the Certificate Coordinator and the Director of the Emphasis in English Language Studies, who will act as advisers for those enrolled in the Certificate program.

Students whose dominant language is not English additionally will take one or both courses in a two-semester sequence in Second Language Writing: Theory and Applications. The first elective course, offered as a topics course in rhetoric, covers the theory of second-language writing. The second part of the sequence, offered as an independent study, consists of a workshop in written discourse, with special emphasis on western academic discourse. It includes documentation and bibliographic searching techniques at the graduate level.

Transfer credits are not accepted in the Certificate program. Students seeking licensure for the teaching of English at levels K-12 should consult the College of Education.

Geography and Earth Sciences

Degree: M.A. *Coordinator*: G.L. Ingalls

MASTER OF ARTS DEGREE IN GEOGRAPHY

The M.A. in Geography emphasizes the application of skills, methods, and theory to problem solving in contemporary society. To this end, students are offered a solid foundation in research methods, problem formulation and solution, quantitative methods, computer applications and GIS. The program offers concentrations in four areas of study: (1) Locational Analysis; (2) Community and Regional Planning; (3) Environmental Analysis; and (4) Transportation Studies. Faculty and students are active in the community and students are encouraged to cap their programs with either funded or unfunded internships in the private or public sector.

One of the program's greatest strengths is the close relationship between its students and faculty and among the students themselves. Small class sizes, close student and faculty contact, and a strong sense of community are considered essential components of the learning and teaching environment at UNC Charlotte.

The applied geography program at UNC Charlotte is recognized as one of the best of its kind in the country. Many of its graduates have gone directly into jobs as professional geographers, research and/or marketing specialists, location analysts, planners, transportation specialists, and private consultants. About 10 percent of the more than 130 graduates of the program have gone on to study in Ph.D. programs.

Additional Admission Requirements. In addition to the requirements for admission to the Graduate School, applicants are required to demonstrate evidence of suitability for the program.

They are evaluated in five major areas: grade point average (GPA), letters of recommendation, personal essays, scores on the Graduate Record Exam, and transcripts of college course work. Each of these are weighted equally during the evaluation of applicants. In general, the department would prefer a GPA of at least 3.1 overall or for the last two years and scores of 1000 or more on the combined Verbal and Quantitative portions of the GRE.

Applicants must demonstrate competence in undergraduate subject matter in their area of study. While the department does not require that applicants have a degree in Geography or Earth Science, they must provide evidence that they are prepared immediately to take full advantage of graduate level course work in Geography and Earth Sciences.

Applicants whose native language is not English must demonstrate their proficiency in English by taking the Test of English as a Foreign Language (TOEFL). Overall scores of 575 with scores of 55 on individual sections (listening comprehension; structure and written expression; vocabulary and reading comprehension) are preferred.

All applicants for admission will be reviewed by the Graduate Advisory Committee. The department will admit applicants on a competitive basis as space in the program allows and grant exceptions to the departmental requirements as deemed in the best interests of the program.

Degree Requirements. The M.A. program in Geography requires a minimum of 36 hours of graduate credit. GEOG 6100, 6200, and 7900 are required of all students. An additional 12 semester hours of coursework at the 5000 level or above is required. Up to 12 hours may be taken in related work. Transfer credits and courses taken at the 4000 level cannot exceed a combined total of 12 hours, including a maximum of 6 hours transferred from other accredited institutions. Coursework pursued in the form of independent studies should be taken as GEOG 6800. The 7900 course is designed as a capstone to the program and should not be taken until all but about one course remains to be completed.

Program Concentrations. The program offers four primary areas or concentrations of study. Students normally focus primarily in one of these; however, with careful consultation with an adviser, special programs of study may be designed which are based on courses from different concentrations. The courses listed within a concentration are suggestions. Students do not have to complete all the courses listed within each concentration.

Location Analysis Concentration. This concentration prepares students for jobs in location research with retail companies, real estate developers, consulting firms, commercial banks, and economic development agencies or for continued academic training in economic geography and location analysis. The following courses are suggested for the location analysis concentration:

GEOG 4155 Retail Location
GEOG 4255 Applied Population Analysis
GEOG 6000 Selected Topics in Economic Geography
GEOG 6030 Topics in Geographic Techniques
GEOG 6101 Store Location Research
GEOG 6102 Site Feasibility Analysis

Community and Regional Planning Concentration. Students who complete this concentration typically become planners in public sector planning agencies. The following courses are

suggested for the community and regional planning concentration:

GEOG 4205 Internal Structure of the City
GEOG 4210 Urban Planning Methods
GEOG 4255 Applied Population Analysis
GEOG 4400 Planning Internship
GEOG 5405 Urban Field Geography
GEOG 6005 Topics in Urban Geography
GEOG 6015 Topics in Regional Geography
GEOG 6020 Topics in Environmental Studies
GEOG 6106 Urban Planning: Theory and Practice

Transportation Studies Concentration. Students in this concentration can pursue course work in transportation systems analysis, policy formulation, impact analysis, and planning to prepare themselves for jobs in the public and private sector, usually as planners in the public sector and as analysts for transportation providers and for consulting companies in the private sector. An extensive laboratory provides hands on research and practicum opportunities in a GIS setting. The following courses comprise the transportation studies concentration:

GEOG 4160 Geography of Transportation Systems
GEOG 5100 Transportation Policy Formulation
GEOG 5105 Transportation Analysis Methods
GEOG 5110 Evaluation of Transportation Impacts
GEOG 5040 Transportation Topics: e.g., GIS Applications

In addition, selected coursework offered by the Civil Engineering and Marketing Departments is available for students in this program. Additional coursework is available through GEOG 6800 (Directed Problems), and the capstone, GEOG 7900 (Individual Research Internship Project).

Environmental Concentration. This concentration encompasses two traditional earth science concentrations -- hydrologic processes and atmospheric studies -- and one interdisciplinary focus on environmental assessment and planning. Each of these concentrations is integrated into the department's GIS technology and supported by field and laboratory equipment. Courses currently being offered in the environmental concentration include:

GEOG 4000 Selected Topics in Geography
ESCI 4140 Hydrologic Processes
ESCI 4145 Ground Water Hydrogeology
ESCI 4150 Climatology
ESCI 4155 Fluvial Processes
ESCI 4160 Remote Sensing
ESCI 5160 Digital Image Processing in Remote Sensing
GEOG 6020 Topics in Environmental Studies
GEOG 6025 Topics in Physical Geography
GEOG 6030 Topics in Geographic Techniques

Examinations. Two examinations are required after 27 hours of the degree requirements have been completed. Any incomplete grades must be removed before a student is eligible to take these exams. All students must pass a comprehensive written examination comprised of questions from the faculty. Questions are generated from faculty responses to the student's thesis/internship committee chairperson's request. While this request is open to the entire faculty, questions typically cover areas within the student's concentration. If exam performances are not satisfactory, students can expect to re-write them or to re-write portions of them. The second exam involves an oral defense of the student's finished research experience. The exam will focus on that project.

Research Experiences. A common research experience is not appropriate for all students. Instead, students should pursue research experiences which are appropriate to departmental faculty resources, individual student's programs, and the availability of opportunities that exist to work with allied agencies or clients on or off campus. One of three options, depending on the previously stated stipulations, will be available: (1) a research experience similar to that of a traditional academic thesis; (2) a research experience which involves a paid internship funded by and arranged with a public or private agency or client; and (3) a research experience involving an internship that is not funded, but arranged with a public or private agency or client. Each of these options fulfills program requirements equally. Each will produce a finished, quality research effort of thesis quality.

Not every student can expect to engage in a paid internship because the number of students frequently exceeds a matching number of opportunities funded in that manner. Unpaid internships provide the same caliber of experience and training in an applied environment. In some cases, that experience may relate student interest with non-profit agencies or social services which simply do not have the resources to fund an internship. In either case, the topic of the internship is defined by the client's problem or needs.

Not every student can expect to develop the thesis option, but it does provide a choice for the student to pursue a research problem in a direction of his/her individual interest. Students who ultimately plan to pursue a Ph.D. degree might be more inclined and encouraged toward that option. The same is true of students who wish to complete their master's program with that kind of individual research activity. In all cases, students must work closely with their advisor and program committee to choose the option which best fits both their particular program and prevailing circumstances.

Continued Enrollment. The department requirements for continued enrollment differ from those of the university in several areas. Students who compile academic records that include either one "U" or two "C's" will be dismissed from the program. Students who consistently show borderline course performance; who are not developing good applied skills in the practice of their chosen area of study; who fail to complete coursework on a timely basis; or otherwise perform unsatisfactorily, or unprofessionally, or in an unethical manner, may be required to complete additional courses or may be dismissed from the program.

Graduate Assistantships. The department normally arranges financial assistance in the form of assistantships or work situations off campus for 25-30 students. Assistantships are available to support students involved with faculty in teaching and in research, on and off campus. Students may be involved in teaching labs and/or assisting faculty in the administration of their classes. On campus research assistantships are usually funded through grant or contract work obtained by faculty. Off campus funding opportunities normally consist of part-time work negotiated by the department with private corporations such as banks or major companies. Regardless of where the assistantship is situated, the department makes every effort to assure parity in funding and equal work conditions for all students receiving funding. Students may receive funding for four semesters if there is evidence that academic performance and progress through the program are satisfactory and performance in assistantship duties is satisfactory. All funding

options are awarded on a competitive basis. To be considered, students must include a graduate assistantship application with their application to the program. Those planning to begin their work during the fall semester should submit their applications before March 1 *especially* if they wish to be considered for funding; for entry in the spring semester applications should be submitted by November 1.

Additional Financial Assistance. Additional funding options such as work/study, financial grants, and loans for graduate study are also available. To explore these additional options, applicants should contact the Graduate School (704-547-3371).

Gerontology

Degree: M.A.
Graduate Certificate

Coordinator: Dena Shenk

MASTER OF ARTS DEGREE IN GERONTOLOGY

The Master of Arts degree in Gerontology is designed to prepare graduates with the knowledge and skills to serve the needs of older adults.

Additional Admission Requirements.

(1) Completion of at least one broad-based undergraduate course in Gerontology or completion of the Professional Development Program in Gerontology offered through the Office of Continuing Education, Extension and Summer Sessions.
(2) Review by the Gerontology Graduate Admissions Committee and recommendation to the Dean of the Graduate School.

Degree Requirements. The M.A. degree program in Gerontology requires a minimum of 36 semester hours including 21 hours in required core courses:

GRNT 6600	Current Issues in Gerontology (3G)
SOCY 6130	Sociology of Aging (3G)
PSYC 6124	Psychology of Aging (3G)
NURS 6275	Health Promotion and Wellness for Older Adults (3G)
GRNT 6201	Research and Methods in Aging I (3G)
GRNT 6202	Research and Methods in Aging II (3G)
GRNT 6400	Practicum (3G)

Students who select the **Thesis Option** complete GRNT 6999. Master of Arts Thesis (6G) and 9 hours of electives/concentration chosen with advice and approval of the academic adviser.

Students who select the **Non-Thesis Option** complete a project in conjunction with GRNT 6201 and 6202 and 15 hours of electives/concentration chosen with advice and approval of the academic adviser.

Concentrations. Elective courses may be selected in consultation with the academic adviser to complete one of the following concentrations:

Generalist: Students selecting courses from this concentration will likely include those working in or preparing for careers in social service policy and programs for older adults.

ANTH	6132	Culture, Health & Aging (3G)
GRNT	4250	Aging Programs (3) (3G)
GRNT	4260	Women and Aging (3) (3G) **OR**
WMST	4260	Women and Aging (3) (3G)
NURS	6276	Common Illnesses Associated with Older Adulthood (3G)
SOCY	4150	Older Individual and Society (3) (3G)
SOWK	4100	Ethnicity and Aging (3) (3G)
SOWK	4101	Social Work Practice with the Elderly (3) (3G)

Planning and Administration: This selection of courses will best meet the needs of those planning to direct programs for older adults or to administer programs including long-term care facilities.

GRNT	4250	Aging Policy and Programs(3) (3G)
GRNT	6210	Aging and Public Policy (3G) **OR**
MPAD	6210	Aging and Public Policy (3G)
GRNT	6211	Administration of Aging Programs (3G)
MPAD	6211	Administration of Aging Programs (3G)
MPAD	6128	Public Policy Analysis & Program Evaluation (3G)
MPAD	6172	Administration of the Health Care System in the U.S. (3G)
NURS	6115	Health Planning in the Health Care System (3G)

Additional electives include:

GRNT 4050	Topics in Gerontology (1-4) (1G-4G)
GRNT 6800	Independent Research Study (3G)

GRADUATE CERTIFICATE IN GERONTOLOGY

The Graduate Certificate in Gerontology is designed to meet the need for graduate education in Gerontology of those who already have a graduate degree in another field or those completing a graduate degree in another field who are interested in working with older adults.

Admission. Students are admitted to the Graduate School in a special category for certificate students. In addition to the general requirements for admission to a certificate program, applicants must submit a current GRE score and provide official transcripts of all baccalaureate and graduate work attempted.

Requirements. A minimum of 15 semester hours with a 3.0 GPA in certificate courses as follows:

GRNT 6600 Current Issues in Gerontology (3G)

Primary Electives. Choose 2 or 3 of the following:

PSYC 6124	Psychology of Aging (3G)
SOCY 6130	Sociology of Aging (3G)
NURS 6275	Health Promotion and Wellness For Older Adults (3G)

Secondary Electives. Choose 1 or 2 of the following:

GRNT	4050	Topics in Gerontology (1-4) (1G-4G)
GRNT	4250	Aging Policy and Programs (3) (3G)
GRNT	6210	Aging and Public Policy (3G) **OR**
MPAD	6210	Aging and Public Policy (3G)
GRNT	6211	Administration of Aging Programs (3G) **OR**

MPAD	6211	Administration of Aging Programs (3G)
MPAD	6218	Public Policy Analysis & Program Evaluation (3G)
NURS	6115	Health Planning in the Health Care System (3G)
SOCY	4134	Families and Aging (3) (3G)

(Secondary electives may also be chosen from other appropriate courses with the approval of the Gerontology Coordinator.)

Transfer credit is not accepted toward a Graduate Certificate in Gerontology. All requirements must be completed within four years from enrollment in the first certificate course.

Health Administration

Degree: M.H.A. *Coordinator:* Carolyn R. Thompson

MASTER OF HEALTH ADMINISTRATION

The Master of Health Administration prepares administrators for a variety of health related institutions in an evolving health care delivery system. Structured to meet the professional standards of the Accrediting Commission on Education for Health Services Administration (ACEHSA), the program is designed to address the needs of current health care managers, clinical professionals who anticipate future administrative responsibilities and pre-professionals who seek to prepare for an entry level career in health care administration.

Administratively located within the Graduate School, the Master of Health Administration program is an intercollegiate and interdisciplinary program with courses taught by faculty from the College of Arts and Sciences, the Belk College of Business Administration, and the College of Nursing and Health Professions. Each course in the curriculum is designed specifically for the program, with an emphasis on issues of health services administration.

Students may enroll in the Master of Health Administration program on a full-time or part-time basis. Classes are scheduled in the evenings and on weekends at both the UNC Charlotte main campus and at UNC Charlotte Uptown located at CityFair.

Additional Admission Requirements. In addition to the general requirements for admission to the Graduate School, the following are required for graduate study in Health Administration:

1. An overall grade point average of at least 3.0 on all previous work beyond high school.
2. Acceptable scores on the verbal and quantitative portions of the Graduate Record Exam, the Graduate Management Admission Test, or the Miller Analogies Test.
3. A course in accounting is prerequisite to enrolling in Accounting for Health Care Management and Finance in Health Care Administration and a course in introductory statistics is required before enrolling in Researchh Methods for Health Care Administration. These prerequisites do not have to be completed before submitting an application for admission.
4. Basic computer skills including word processing and use of spread sheets.

Applicants with records of high quality professional experience who do not fulfill these formal requirements should discuss with the Coordinator of the Health Administration Program other factors that may have a bearing on admission.

Degree Requirements. The Master of Health Administration requires 43 hours, including a core curriculum focused on knowledge, skills and values relevant to health services administration and elective studies to meet individual professional needs. A student may prepare a thesis in lieu of two elective courses.

Core Courses (34 hours)

HADM 6103	Health and Disease
HADM 6112	Introduction to US Health Care Systems
HADM 6114	Economics of Health Policy
HADM 6123	Accounting for Health Care Management
HADM 6125	Finance in Health Care Administration
HADM 6130	Health Law and Ethics
HADM 6141	Research Methods for Health Care Administration
HADM 6145	Organization Theory and Leadership
HADM 6147	Human Resource Management
HADM 6152	Information Resource Management
HADM 6166	Strategic Management of Health Services Organizations

Elective Studies. (9 hours) Selected from courses within the Health Administration curriculum or other areas approved by the MHA Coordinator

Comprehensive Examination. Each student must successfully complete a comprehensive examination designed to test the knowledge and skills presented within the core curriculum.

Internships. Each student in the program is required to demonstrate professional experience in the health care delivery system. This requirement may be demonstrated through (1) a full-time position in a health care delivery setting or (2) an approved internship in a health care delivery setting. Students who have no professional experience in a health care setting are required to undertake an internship experience. Each student must complete an MHA Internship Information form, describing professional experience or internship preference, and submit it to the MHA office.

Thesis. Students may elect a two course thesis sequence to produce and defend independent research relevant to health services administration which demonstrates a contribution to professional knowledge through systematic investigation. This requires permission of the graduate faculty member who would direct the study and permission of the MHA coordinator prior to registration for thesis credit.

MHA/MSN Dual Degrees. The College of Nursing and Health Professions and the Master of Health Administration program offer an integrated curriculum leading to dual degrees, the M.S.N. and the M.H.A. Applicants must hold a B.S.N.

degree and must be admitted to both programs. This program is described in detail with other graduate programs in the College of Nursing and Health Professions.

History

Degree: M.A. *Coordinator*: Cynthia Kierner

MASTER OF ARTS DEGREE IN HISTORY

The program for the Master of Arts degree in History is designed to develop the methodological, literary and conceptual skills of the professional historian. Graduates of the program will be able to employ this expertise as students in a doctoral program, as professionally oriented history teachers in the secondary schools, or as citizens more acutely aware of the historical development of their society.

The Department offers courses in African, American, Asian, European, and Latin American history. Information on specific courses and areas of concentration is available from the Graduate Coordinator.

Additional Admission Requirements. In addition to the general requirements for admission to the Graduate School, the following are required for graduate study in History:

1. A satisfactory undergraduate GPA in History or a related discipline.
2. Acceptable performance on the math and verbal portions of the G.R.E.

Degree Requirements. The Master of Arts degree in History requires completion, with a GPA of 3.0 or better, of at least of 30 hours in approved graduate courses. These hours must include at least 24 hours in History, of which at least 15 hours are in seminars or colloquia open only to graduate students, and no more than 6 hours in individually designed reading or research courses. All candidates for the degree must complete HIST 6693 (Historiography) with a grade of *B* or better. Students may elect to take up to 6 hours in another field.

Candidates seeking graduate level teacher licensure may use the elective option to take courses in professional education selected in consultation with the College of Education. If more than 6 hours must be taken to satisfy licensure requirements, they will be added to the 30 hours required for the degree in history.

No more than 6 transferred hours may be approved for application to the requirements for the degree.

All requirements, including comprehensive examination or thesis defense, must be completed within six calendar years of the date of first enrollment in the program.

Although students are not required to demonstrate knowledge of a foreign language, they are expected to be able to use whatever languages are required to pursue their research interests.

All students in the program are expected to maintain a *B* average in all courses taken. Students who do not meet this expectation will be subject to suspension on recommendation of the Graduate Committee of the Department of History.

Comprehensive Examination/Thesis Defense. Candidates must successfully complete either a comprehensive written examination based on a reading list prepared in consultation with their committee or a master's thesis. In both cases candidates must then pass an oral examination based on their written examination or thesis.

Admission to Candidacy. An Admission to Candidacy form must be submitted in the semester prior to the semester the student plans to take the Comprehensive Examination.

Administration. The admission of students and approval of each student's program is the responsibility of the Graduate Committee of the Department of History.

The Graduate Coordinator is responsible for planning and monitoring each student's program and for advising and assisting the student in selecting an Examining Committee.

The Examining Committee, consisting of two graduate faculty members from the Department of History and a third member selected from History or another department, conducts the student's comprehensive written and final oral examinations.

Assistantships. The History Department offers several graduate assistantships that are awarded competitively based on the academic promise of the student. Candidates must be admitted to the graduate program and have submitted the application for assistantship prior to March 30.

DOCTOR OF PHILOSOPHY DEGREE IN HISTORY: JOINT PROGRAM WITH THE UNIVERSITY OF ABERDEEN

This program combines the M.A. degree from UNC Charlotte, or an accepted institution, with a Ph.D. conferred by the University of Aberdeen in Scotland. Students accepted into this program spend one year in Charlotte, one year in Aberdeen, and a third year at either of these two institutions. Ph.D. candidates work with faculty and utilize research facilities in both American and Europe. Teaching and research assistantships are available on a competitive basis at both universities.

Both universities offer a wide range of courses and fields of specialization. The Department of History at UNC Charlotte possesses particular expertise in United States history, the history of the American South, and the comparative history of race, gender, urbanization, and industrialization. The Department of History at the University of Aberdeen possesses particular expertise in non-Anglocentric British history; the North Sea and Baltic states, including Russia; diet, disease, and death; gender; and the relationship between Scotland and America.

Additional Admission Requirements. In addition to the general requirements for admission to the Graduate School, the following are required for graduate study in History at the doctoral level:

1. A master's degree with a GPA of 3.5 or better in all master's level courses.

2. Submission of the M.A. thesis or a substantial research paper.
3. Above average performance on the math and verbal portions of the G.R.E.

Degree Requirements. The Ph.D. in History requires successful completion of a dissertation proposal, a qualifying examination, and a doctoral dissertation. Coursework for the Ph.D. consists primarily of directed reading and research in preparation for writing the dissertation.

All degree requirements, including the dissertation defense, should be completed in 3 to 4 years. All requirements must be completed within six years of enrolling in the program.

Although students are not required to demonstrate proficiency in a foreign language, they must possess the foreign language skills necessary to do primary research in their intended field of specialization.

Qualifying Examination. Students are required to complete both written and oral qualifying examinations during their second semester at UNC Charlotte. The written examination consists of a dissertation proposal; the oral examination covers both the student's general field of specialization and the proposed dissertation topic.

Dissertation Defense. Doctoral dissertations are not to exceed 100,000 words in length. The dissertation defense is a final oral examination at which the student presents and defends his/her research before a committee of Aberdeen and UNC Charlotte faculty. The defense committee can reject the dissertation and instruct the student to revise the work or accept it and thereby confer the Ph.D.

Assistantships. Teaching and research assistantships are available at both universities on a competitive basis. Applications for assistantships at UNC Charlotte should be submitted simultaneously with those for admission to the Ph.D. program.

Liberal Studies

Degree: M.A. *Coordinator:* Judith D. Suther

MASTER OF ARTS DEGREE IN LIBERAL STUDIES

The Master of Arts degree program in Liberal Studies is designed primarily for adults seeking to enhance their general education in the liberal arts at the graduate level. It provides a flexible, multidisciplinary framework to accommodate the varied undergraduate backgrounds and personal interests that students bring to the program. The curriculum draws upon the full range of the humanities, social sciences, and natural sciences. The emphasis is on liberal arts education rather than on specialized study or professional training.

For recent recipients of the baccalaureate degree, the Liberal Studies program may provide the insight needed to make an informed career choice, or it may enhance opportunities in a career already launched. For returning students, graduate liberal studies may renew ties with university life or lead to a change of career. For persons with significant work experience, the program offers a chance to integrate the life of the mind with that of the workplace. Just as students come to the Liberal Studies program from a variety of fields, so they pursue a variety of careers after graduation. The most widely represented are in business, education, government, law, and social services.

Although the Liberal Studies program is not exclusively an evening program, the majority of courses are offered at times convenient for working adults. It is possible to earn the degree in a timely fashion through evening courses only.

Additional Admission Requirements. In addition to the general requirements for admission to the Graduate School, the following are required for graduate study in Liberal Studies:

1. A GPA of at least 2.75 on academic work beyond high school and 3.0 for courses prerequisite to the area of proposed graduate study.
2. Satisfactory scores on the Miller Analogies Test or the verbal and Analytical portions of the Graduate Record Examination.
3. A two-page essay describing the applicant's objectives in undertaking graduate work in Liberal Studies.
4. A resumé of employment history or volunteer experience (for applicants who have been out of school for at least five years or whose baccalaureate dcgree was delayed).
5. Acceptance into the program is contingent on an interview with members of the Liberal Studies Faculty Advisory Committee.

Degree Requirements. The master's program in Liberal Studies requires a minimum of 30 semester hours of graduate work with grades of A or B, including at least 15 semester hours in courses open only to graduate students. A course in which a student receives a grade of 'C' is not allowable as part of the 30 required hours.

The program begins with two core courses that give students some common grounding in the issues of liberal arts education. Each student then chooses a program emphasis by completing at least four courses that focus on a common theme, a Liberal Studies elective course, and two elective courses that can be taken in any department in the College of Arts and Sciences. The program concludes with a seminar, a master's essay or project, and a comprehensive examination. The requirements in outline:

	Semester Hours
Core courses: LBST 6101 and 6102	6
Program emphasis: four related courses focusing on a theme developed by the student and faculty advisor	12
Liberal studies elective	3
General electives	6
Concluding seminar: LBST 6600	3

No more than 6 hours of independent study may be applied to the degree. Students requesting independent study must have successfully completed at least 12 semester hours in the program, including LBST 6101 and 6102. A form for such requests is available in the Coordinator's office and must be completed and the study approved in advance of registration.

Comprehensive Examination. Each candidate concludes the program with a comprehensive examination taken during the

final semester of course work. The examination is a part of the concluding seminar and is individually designed, based on each student's program. It allows the student to integrate material from a variety of disciplines and to demonstrate understanding of the scope of Liberal Studies.

Assistantships. A limited number of graduate assistantships are available each year. In order to be fully competitive, applications must be received by March 15. Application forms are available through the Graduate School.

Prizes. A Spring Prize of $250 is awarded annually for an outstanding paper or project completed for a LBST course. Only students admitted to the Liberal Studies program by the submission deadline for the prize are eligible.

Mathematics

Degrees: M.A., M.S., Ph.D. *Coordinator*: Joel D. Avrin

Mathematics Education

Degree: M.A. *Coordinator*: Phillip E. Johnson

MASTER OF ARTS DEGREE IN MATHEMATICS

The Master of Arts degree in Mathematics is designed both to provide advanced skills and knowledge for persons seeking either positions in industry or in government, or teaching positions at the community college level, and to provide professional development to persons currently in such positions. Graduates of the program also are prepared to enter directly into at least the second year of a Ph.D. program in mathematics, applied mathematics or statistics, depending on the particular course of study.

Additional Admission Requirements. In addition to the general requirements for admission to the Graduate School, the following are required for graduate study in Mathematics:

1. Applicants must present evidence of the satisfactory completion of at least 27 semester hours of mathematics approved by the department Graduate Committee.
2. A satisfactory score is required on the Aptitude Portion of the Graduate Record Examination.
3. It is recommended that the student have a basic knowledge of at least two of the areas of algebra, real analysis and topology.

Degree Requirements. The Master of Arts degree in Mathematics requires successful completion of at least 30 semester hours of graduate work approved by the department Graduate Committee including: MATH 5143 and 5144 or their equivalents, at least one course each from two of the groups I, II, III, and V, and at least 15 hours in 7000-level courses. With the approval of the department Graduate Committee, one 3-hour, non-thesis 6000-level course in computer science of a theoretical nature may be applied toward the 15 hours. Candidates for the degree must demonstrate, to the satisfaction of the department Graduate Committee, competence on the general knowledge in at least three of five groupings of courses listed below. This may be accomplished by (a) successful performance on a written comprehensive examination or (b) successful completion of courses in these areas.

Group I Applied Mathematics:

OPRS	4113	Game Theory (3G)
OPRS	4114	Dynamic Programming (3G)
OPRS	5111	Linear Programming (3G)
OPRS	5112	Non-Linear Programming (3G)
MATH	5165	Numerical Linear Algebra (3G)
MATH	5172	The Finite Element Method (3G)
MATH	5173	Ordinary Differential Equations (3G)
MATH	5174	Partial Differential Equations (3G)
MATH	5176	Numerical Methods for Partial Differential Equations (3G)
MATH	7172	Partial Differential Equations (3G)
MATH	7176	Advanced Numerical Analysis (3G)
MATH	7177	Applied Optimal Control (3G)
MATH	7178	Comp. Methods for Fluid Dynamics (3G)
MATH	7273	Advanced Finite Element Analysis (3G)

Group II Probability-Statistics:

STAT	5123	Applied Statistics I (3G)
STAT	5124	Applied Statistics II (3G)
STAT	5126	Theory of Statistics I (3G)
STAT	5127	Theory of Statistics II (3G)
STAT	7027	Topics in Statistics (3G)
STAT	7122	Advanced Statistics I (3G)
STAT	7123	Advanced Statistics II (3G)
STAT	7127	Linear Statistical Models (3G)
STAT	7133	Multivariate Analysis (3G)
MATH	5128	Applied Probability I (3G)
MATH	5129	Applied Probability II (3G)
MATH	7120	Probability Theory I (3G)
MATH	7121	Probability Theory II (3G)
MATH	7125	Stochastic Processes (3G)

Group III Algebra-Topology:

MATH	4163	Modern Algebra (3G)
MATH	4164	Abstract Linear Algebra (3G)
MATH	4181	Introduction to Topology (3G)
MATH	7163	Modern Algebra I (3G)

Group IV Analysis:

MATH	5143	Analysis I (3G)
MATH	5144	Analysis II (3G)
MATH	7141	Complex Analysis I (3G)
MATH	7143	Real Analysis I (3G)
MATH	7144	Real Analysis II (3G)

Group V Computer Science:

All 5000- and 6000-level Computer Science courses.

Thesis. Completion of a thesis is optional. With the approval of the department Graduate Committee, a candidate may receive up to six of the 15 hours required at the 7000 level for the writing of a master's thesis on an approved topic. This thesis may be original work, work of an expository nature, or the mathematical formulation and solution of a particular industrial or business problem suggested by the career interests of the student. A candidate may receive no more than six of the hours required at the 7000 level for course and thesis work in computer science. If the thesis option is elected, the candidate will be required to defend his/her thesis in an oral examination.

Comprehensive Examination. A candidate must perform satisfactorily on an oral comprehensive examination over his/her program of study.

MASTER OF ARTS DEGREE IN MATHEMATICS EDUCATION

The Master of Arts degree in Mathematics Education is designed primarily for secondary school teachers interested in professional growth and graduate licensure in mathematics. Emphasis in this program is given to developing depth and breadth in mathematics appropriate to the role of the teacher.

Additional Admission Requirements. In addition to the general requirements for admission to the Graduate School, the following are required for graduate study in Mathematics Education:

1. Eighteen hours of approved undergraduate work in mathematics.
2. Evidence of satisfactory scope and grade point average in undergraduate courses in professional education.
3. Possession of a North Carolina Class "A" teacher's license or the equivalent. An applicant may be admitted on the condition that he/she satisfy the Class "A" requirements early in his/her course of study. Work applied to the Class "A" deficiency may not be applied toward the degree.
4. A satisfactory score on the Aptitude Portion of the Graduate Record Examination.

Degree Requirements. Each candidate for the degree and for graduate licensure in mathematics must complete at least 30 hours of graduate credit including at least 15 hours in courses at the 6000-level or above. Programs of study beyond these 30 hours may be required to remove deficiencies in undergraduate programs or to develop areas of graduate competency. Specific requirements are:

1. 18 hours of mathematics, at least nine of which are at the 6000-level or above;
2. Six hours approved for this program by the College of Education. (RSCH 6101 and 6110 are recommended);
3. At least six hours in mathematics, mathematics education, or in a related area approved by the student's adviser.

Approval of the program of each student and provision of advice regarding progress toward the degree are the responsibility of an adviser appointed by the Department of Mathematics at the time of admission.

Comprehensive Examinations. Each student must pass a comprehensive examination, including an oral examination, on the overall work presented for the degree.

MASTER OF SCIENCE DEGREE IN APPLIED MATHEMATICS

The Master of Science degree in Applied Mathematics is designed to develop critical thinking and intuition, and to provide advanced work in the techniques of mathematical analysis and their application to the problems of industry and technology. Skills are developed to deal with problems encountered in industry, business, and governmental work; hold leadership positions in industry or government work; teach Applied Mathematics at the undergraduate or community college level; and study Applied Mathematics leading to the Ph.D. degree.

Degree Requirements. A candidate for the Master of Science degree in Applied Mathematics must complete at least 30 semester hours of graduate work approved by the department Graduate Committee to include:

Core Requirements: (21 semester hours)

(1)
- MATH 5143 Analysis I (3G)
- MATH 5144 Analysis II (3G)
- MATH 5165 Numerical Linear Algebra (3G)

(2) One elective in Numerical Analysis selected from:
- MATH 5172 The Finite Element Method (3G)
- MATH 5176 Numerical Methods for Partial Differential Equations (3G)

(3) One elective in Advanced Analysis selected from:
- MATH 7141 Complex Analysis I (3G)
- MATH 7143 Real Analysis I (3G)
- MATH 7144 Real Analysis II (3G)

(4) Two electives in Advanced Applied Mathematics selected from:
- MATH 7172 Partial Differential Equations (3G)
- MATH 7176 Advanced Numerical Analysis (3G)
- MATH 7177 Applied Optimal Control (3G)
- MATH 7178 Computational Methods for Fluid Dynamics (3G)
- MATH 7273 Adv. Finite Element Analysis. (3G)

Electives: (6 semester hours)

(1) One advanced elective from:
- MATH 7141 Complex Analysis I (3G)
- MATH 7143 Real Analysis I (3G)
- MATH 7144 Real Analysis II (3G)
- MATH 7172 Partial Differential Equations (3G)
- MATH 7176 Advanced Numerical Analysis (3G)
- MATH 7177 Applied Optimal Control (3G)
- MATH 7178 Computational Methods for Fluid Dynamics (3G)
- MATH 7273 Adv. Finite Element Analysis (3G)
- MATH 7893 Thesis (0-3G)

(2) One elective in Mathematics or a suitable area of application to be selected with the approval of the student's adviser. Suggested electives include:

- OPRS 4113 Game Theory (3G)
- STAT 5123 Applied Statistics I (3G)
- CSCI 5131 Simulation (3G)
- MEGR 4111 Heat Transfer (3G)
- MEGR 4112 Intermediate Fluid Mechanics (3G)
- MEGR 6113 Adv. Conductive Heat Transfer (3G)
- MEGR 6141 Theory of Elasticity II (3G)

Research Seminar: (3 hours)

All candidates for the degree must complete three hours of MATH 7691 (Research Seminar) in which they carry out an independent project under the supervision of a member of the graduate faculty. The project could involve a specific application to a concrete problem of techniques identified in the literature or studied in other courses. All projects are subject to prior approval of the department Graduate Committee and must be successfully defended before a committee of three graduate faculty members appointed by the department Graduate Committee.

Thesis. A student may choose to expand the work begun in MATH 7691 into a master's thesis by registering for three hours

of MATH 7893 to fulfill the advanced elective requirement (1) described above. This thesis option affords the student the opportunity to do professional/scholarly work demonstrating proficiency in the area of Applied Mathematics.

Comprehensive Examination. Each candidate for the degree in Applied Mathematics must perform satisfactorily on a final comprehensive examination. This examination will be set and administered by a committee appointed by the department Graduate Committee. It may be either in written or oral form, and it will cover those areas of study and/or research deemed appropriate by the committee.

MASTER OF SCIENCE DEGREE IN APPLIED STATISTICS

The Master of Science degree in Applied Statistics is designed to provide advanced skills and knowledge in the planning, design, testing, and implementation of statistical methods. Skills are developed to deal with the problems encountered in statistical applications in business, industry and government; hold administrative positions requiring planning and implementation of statistical analysis; teach statistics at the undergraduate or community college level; and study statistics leading to the Ph.D. degree.

Additional Admission Requirements. In addition to the general requirements for admission to the Graduate School, the following are required for graduate study in Applied Statistics:

1. An overall GPA of at least 3.0 on all previous college work including a GPA of at least 3.0 in courses prerequisite to the area of applied statistics.
2. Evidence of undergraduate preparation in mathematics and computer science including: 11 semester hours of calculus at the level of MATH 1141/1142/2141; 3 semester hours of linear algebra at the level of MATH 2164; 3 semester hours of differential equations at the level of MATH 2171; 6 semester hours of probability and statistics at the level of MATH 3122/3123; and 3 semester hours of computer programming at the level of CSCI 1100 or 1201 and its lab.

Degree Requirements. A candidate for the Master of Science degree in Applied Statistics must complete a minimum of 33 semester hours of graduate work approved by the department Graduate Committee including:

Core Requirements (24 semester hours)

STAT 5123 Applied Statistics I (3G)
STAT 5124 Applied Statistics II (3G)
STAT 5126 Theory of Statistics I (3G)
STAT 5127 Theory of Statistics II (3G)
STAT 7027 Topics in Statistics (3G)
STAT 7127 Linear Statistical Models (3G)
STAT 7133 Multivariate Analysis (3G)
MATH 7691 Research Seminar (1-3G)

Electives (9 semester hours)

(1) Two course selected from among:
CSCI 5131 Computer Simulation (3G)
STAT 7027 Topics in Statistics (3G)
MATH 5128 Applied Probability I (3G)
MATH 5129 Applied Probability II (3G)
MATH 5143 Analysis I (3G)
MATH 5165 Numerical Linear Algebra (3G)
MATH 7120 Probability Theory I (3G)
MATH 7121 Probability Theory II (3G)
MATH 7143 Real Analysis I (3G)
MATH 7692 Research Seminar (3G)
OPRS 4113 Game Theory (3G)
OPRS 4114 Dynamic Programming (3G)
OPRS 5111 Linear Programming (3G)
OPRS 5112 Non-linear Programming (3G)

(2) Any MATH/STAT/OPRS course at the 7000 level.

Students who, because of their undergraduate work or other experience, can demonstrate sufficient knowledge of the material in one or more of the core courses may be exempted from taking the course or courses. Exemption from a course carries no credit towards the degree.

Research Seminar and Thesis Option (3 semester hours)

All candidates for the Master of Science degree in Applied Statistics are required to complete 3 hours of MATH 7691 (Research Seminar) in which they carry out an independent project under the supervision of a member of the graduate faculty. The project could involve a specific application of techniques identified in the literature or studied in other courses. All projects are subject to the prior approval of the department Graduate Committee and must be successfully defended before a committee of three graduate faculty members appointed by the department Graduate Committee.

A student may choose to expand the work begun in MATH 7691 (Research Seminar) into a Master's Thesis by registering for 3 hours of MATH 7893 (Thesis) to fulfill the elective requirement under (2) above. This thesis option affords the student the opportunity to do professional and scholarly work demonstrating proficiency in the area of applied statistics.

Comprehensive Examination. Each candidate for the Master of Science degree in Applied Statistics must perform satisfactorily on an oral comprehensive examination over the candidate's program of study.

DOCTOR OF PHILOSOPHY DEGREE IN APPLIED MATHEMATICS

The Ph.D. degree program in Applied Mathematics is designed to enable its students to master a significant body of mathematics, including a specialty in applied mathematics; to relate this knowledge to a coherent area of science or engineering, and to carry on fundamental research in applied mathematics at a nationally competitive level. The recipient of this degree will, according to his or her abilities and choice of sub-specialty, be able to work effectively in a research and development environment involving mathematical or statistical analysis and modeling in business, government or industry; to teach mathematics at the college or university level; or to carry on fundamental research in his or her area of specialty.

Additional Admission Requirements. In addition to the requirements of the Graduate School for admission to doctoral study, applicants must have completed at least 27 hours of courses in the mathematical sciences at the undergraduate level, as approved by the department Graduate Committee, with grades of *C* or better. Admission requires that the candidate be able to

ake Real Analysis 7143 (or its equivalent). Applicants who nave not completed the equivalent of MATH 5143-5144 but whose record is otherwise satisfactory may be admitted to one of the master's programs in the department. For prospective students who have done work in mathematics beyond the bachelor's degree, performance on that work will be considered in admissions decisions. Candidates for admission must make satisfactory scores on both the aptitude portion of the Graduate Record Examination (GRE) and the subject test in mathematics.

Students are admitted to the program by the Graduate School, based on the recommendation of the department Graduate Committee or its designate, the Graduate Program Coordinator. Recommendations are based on the Committee's judgement of the candidate's ability to complete the program, as supported by the application materials. The department may waive certain requirements if it judges the candidate to be capable of completing the program. If there are more candidates than can be accommodated, candidates are admitted in order of perceived mathematical ability, promise of success, and suitability to the program.

Degree Requirements

Program of Study. The student must complete an approved program of study, including a minor, typically including approximately 54 credit hours. The minor is interdisciplinary and may be satisfied by 9 hours of graduate work outside the mathematics department, by 6 credit hours for a project in an area of application, or by a combination of external coursework and directed project in an area of application totaling 9 credit hours.

Each student will have an advisory committee appointed by the department Graduate Committee in consultation with the student and approved by the Department Chair. It includes the prospective dissertation adviser as chair, or co-chair, if the dissertation adviser is not a member of the Department of Mathematics. The advisory committee should be appointed as soon as is feasible, usually within a year after passing the Preliminary Examination. It will have the responsibility of constructing and approving the program of study which includes the minor. Prior to the appointment of the advisory committee the student will be advised by a graduate faculty member appointed by the department Graduate Committee.

Grades. A student is expected to achieve A's or B's in all courses included in the program of study and must have at least a 3.0 GPA to graduate. The dissertation is graded on a pass/unsatisfactory basis and, therefore, will not be included in the cumulative average. An accumulation of more than two marginal (C) grades will result in termination of the student's enrollment in the program. If a student makes a grade of *U* on any course, enrollment will be terminated and the student cannot take further graduate work without being readmitted to the program. Readmission to the program requires approval of the Dean of the Graduate School upon the recommendation of the department Graduate Committee.

Transfer Credit. Only courses with grades of A or B may be accepted for transfer credit. Transfer credit must be approved by the department Graduate Committee, and cannot exceed the limit set by the Graduate School.

Preliminary Examination. The student is expected to take the preliminary examination within three semesters of being admitted to the Ph.D. program. The examination consists of two parts: a written examination based on Real Analysis I and II (7143-7144) and a written examination based on two other related courses chosen by the student and approved by the department Graduate Committee. The student must pass both examinations in a single attempt in order to pass the preliminary examination. At the discretion of the department Graduate Committee, the student passing only one part of the examination on the first attempt may be allowed to retake the preliminary examination a second time. A student who fails the preliminary examination twice is disenrolled from the Ph.D. program.

Qualifying Examination and Admission to Candidacy. Each student must pass a comprehensive oral examination covering her/his chosen field of research and related advanced course work. The exam is conducted by the student's Advisory Committee and may include an additional written examination. The exam is open to the graduate faculty of the department. The student is expected to take the qualifying examination within two years of the appointment of the student's Advisory Committee. A student who fails the qualifying examination twice is disenrolled from the Ph.D. program. The dissertation topic may be proposed after the student has passed the qualifying examination. A doctoral student advances to candidacy after the dissertation topic has been approved by the student's advisory committee and the Dean of the Graduate School.

Dissertation. The student must complete and defend a dissertation based on a research program approved by the student's dissertation adviser which results in a high quality, original and substantial piece of research. The student must orally present and successfully defend the dissertation to the Student's Advisory Committee in a defense that is open to the public. A copy of the dissertation must be made available to the graduate faculty of the department at least two weeks prior to the public defense. The dissertation will be graded on a pass/no credit basis by the Advisory Committee and must be approved by the Department Chair and the Dean of the Graduate School.

Residency Requirement. The student must enroll for one continuous full-time year (i.e. two consecutive semesters of at least nine graduate credit hours in each semester) following admission to the program.

Language and Research Tool Requirements. Each student must demonstrate a reading knowledge of French, German or Russian by passing a written translation exam in one of these languages conducted by the Mathematics Department. In addition, the student must demonstrate significant computer expertise applicable to research or teaching in his or her major field as approved by the student's Advisory Committee. The computer expertise requirement may include course work or work on a project and may overlap with the minor requirement.

Time Limit for Degree Completion. The student must achieve admission to candidacy within six years after admission to the program and complete all requirements within six years after admission to candidacy for the Ph.D. degree. All requirements for the degree must be completed within eight years after first registration as a doctoral student.

Nursing

Degree: M.S.N., M.S.N./M.H.A.

MASTER OF SCIENCE IN NURSING

The NLN-accredited Master of Science in Nursing degree is designed to prepare the nurse for advanced practice in a specialized area of nursing as clinical nurse specialist, nurse practitioner or nurse administrator. Six specialty concentrations are available:

Care of the Chronically Ill Adult
Community Health Nursing
Family Nurse Practitioner
Psychiatric/Mental Health Nursing
Nurse Anesthesia
MSN/MHA: dual degree program in Nursing and Health Administration

Additional Admission and Progression Requirements. In addition to the general requirements for admission to the Graduate School, the following are required for graduate study in Nursing:

1. Current unrestricted licensure as a Registered Nurse. Current licensure to practice nursing in North Carolina or the state identified by faculty for clinical practice is required for progression into clinical courses.
2. Baccalaureate degree from a National League for Nursing accredited nursing program.
3. Satisfactory performance on the Aptitude Portion of the Graduate Record Exam or the Miller Analogies Test.
4. One year of professional nursing practice following completion of the baccalaureate degree is recommended.
5. Overall GPA of at least 3.0 on the last 60 semester hours attempted.
6. Completion of a statistics course with a grade of *C* or better.
7. The application for admission and all supporting credentials must be received in the Office of Graduate Admissions no later than **November 15** for spring admission, **March 15** for summer admission and **July 1** for fall admission.

Degree Requirements: The MSN specialty concentrations require completion of 38 to 70 graduate credit hours depending on the specialty. Specific requirements and prerequisites for each program are listed below. Most programs are designed to accommodate full-time and part-time students and many classes are held in the evening to serve students who are employed.

Graduate transfer credit may be accepted from another accredited institution for up to six semester hours upon approval of the student's adviser, the department chair and the Dean of the Graduate School. All course work, including accepted transfer credits, must be completed within a six-year period.

Assistantships. A limited number of graduate assistantships are available. Information about them is available in each Department and the Office of the Associate Dean for Academic Affairs, College of Nursing and Health Professions.

Additional Financial Aid. Scholarships from the North Carolina Nurse Scholars Program - Master's Program (M-NSP) are available to part-time or full-time students admitted to the nursing program for up to two years of study. The M-NSP scholarships are competitive and preference will be given to full-time students. Awards are not based on financial need. The application deadline is early May. Further information and application forms are available in the Office of Student Affairs in the College of Nursing and Health Professions.

A limited number of Professional Nurse Traineeships are available to full-time graduate nursing students admitted to a clinical specialty concentration. The traineeship awards provide in-state tuition/fees and a small stipend. Further information and application forms are available from the Office of the Associate Dean for Academic Affairs, College of Nursing and Health Professions.

Adult Health Nursing

Degree: M.S.N. *Coordinator:* Leslie Hussey

Specialty Concentration for Advanced Practice in Care of Chronically Ill Adult

Advanced practice nurses specializing in chronic illness care will be prepared to function in diverse settings, such as in-and out-patient hospital settings, rehabilitation settings, homes, nursing homes, shelters, clinics, physician's offices, day care counter, and elderly housing settings. They identify high risk behaviors that have the potential to lead to chronic illness; teach health promotion and disease prevention; identify patients with chronic illness; manage care; and collaborate with patients and their families to manage care, identify high risk behaviors, develop healthy lifestyles to prevent acute episodes of illness and prevent further disability.

Additional Admission Requirements. In addition to requirements of the Graduate School and College of Nursing and Health Professions, applicants to the program in Adult Health Nursing must present college credit or documented college course content in physical assessment.

Degree Requirements. The specialty concentration will consist of 43 semester hours that can be completed on a part- or full-time basis:

Core Courses (9 hours)
NURS 6101 Theoretical Bases for Nursing Practice (3G)
NURS 6115 Health Policy and Planning in the United States (3G)
NURS 6160 Research in Nursing and the Health Professions (3G)
Exam/Thesis/Project

Cognate Courses (9 hours)
BIOL 6050 Advanced Human Physiology (3G)
BIOL 6050 Pathophysiology (3G)
RSCH 6110 Inferential Statistics (3G)

Specialty Concentration (22 hours)
NURS 6220 Pharmacotherapeutics in Advanced Nursing Practice (3G)
NURS 6210 The Family and Health (3G)

NURS 6230 Health Assessment for Advanced Nursing Practice (3G)
NUCI 6100 Chronic Illness Concepts and Theories for Advanced Nursing Practice (2G)
NUCI 6401 Health Lifestyles and Chronic Illness Care I (3G)
NUCI 6402 Acute Care of the Chronically Ill Adult (4G)
NUCI 6403 Advanced Practice Nursing in Chronic Care (4G)

Guided Elective (3 hours)
Students will be guided in selecting an elective appropriate to their focus on chronic care nursing.

Specialty Concentration in Nurse Anesthesia

The specialty concentration in Nurse Anesthesia is offered in conjunction with the Carolinas Medical Center and is accredited by the Council on Accreditation of Nurse Anesthesia Education Programs. It provides both the theory and clinical practice required to qualify to take the national certifying examination upon graduation. In addition to MSN core courses, students complete cognate and clinical courses in nurse anesthesia as well as a clinical residency at Carolinas Medical Center.

Additional Admission Requirements. In addition to the requirements of the Graduate School and College, applicants to the Nurse Anesthesia program must have: (1) one year of critical care experience with adult clients; and (2) licensure in Advanced Cardio Life Support (ACLS).

Degree Requirements. The program requires completion of 70 semester hours in approved courses including:

Core Courses (15 hours)
NURS 6101 Theoretical Basis for Nursing Practice (3G)
NURS 6115 Health Policy and Planning in the U.S. (3G)
NURS 6160 Research in Nursing and the Health Professions (3G)
NURS 6962 Thesis/Project (3G)
RSCH 6110 Inferential Statistics or Equivalent (3G)

Clinical Concentration (55 hours)
BIOL 6050 Advanced Human Physiology (3G)
NUAN 6151 Principles of Anesthesia I (3G)
NUAN 6152 Principles of Anesthesia II (3G)
NUAN 6153 Principles of Anesthesia III (2G)
NUAN 6154 Pharmacology I (4G)
NUAN 6155 Pharmacology II (4G)
NUAN 6156 Applied Physics (3G)
NUAN 6157 Pathophysiology (3G)
NUAN 6158 Pathophysiology II (3G)
NUAN 6159 Professional Aspects (1G)
NUAN 6651 Anesthesia Seminar (1G)
NUAN 6485 Clinical Residency I (7G)
NUAN 6486 Clinical Residency II (7G)
NUAN 6487 Clinical Residency III (4G)
NUAN 6489 Clinical Residency IV (0G)

Family and Community Nursing

Degree: M.S.N., M.S.N./M.H.A.

Specialty Concentration in Community Health Nursing

The Community Health Nursing specialty prepares nurses to assess communities, identify high risk populations, and to work with those populations to develop culturally sensitive, acceptable and realistic community-based nursing services to meet the needs of North Carolina residents who live in urban and rural areas.

Additional Admission Requirements. In addition to the general requirements for admission to the Graduate School, and the M.S.N. degree program, the following are required for graduate study in the Community Nursing concentration:

1. BSN degree from an NLN accredited program with an overall GPA of at least 3.00 (on a 4.0 scale).
2. Satisfactory performance on the Graduate Record Exam (GRE) or the Graduate Management Admission Test (GMAT).
3. A statement of purpose.
4. A personal interview.

Degree Requirements. The concentration requires completion of 38 semester hours in approved courses, including core courses:

Core Courses (12 hours)
NURS 6101 Theoretical Basis for Nursing Practice (3G)
NURS 6160 Research in Nursing and the Health Professions (3G)
NURS 6115 Health Policy and Planning in the U.S. (3G)
RSCH 6110 Inferential Statistics (3G)

Eighteen semester hours are required in specialty courses:

Specialty Concentration (18 hours)
NUCN 6201 Advanced Nursing Care in the Community (3G)
NUCN 6202 Organization and Delivery of Health Care In Urban and Rural Environments (3G)
NUCN 6203 Primary Prevention with High Risk Populations (3G)
NUCN 6405 Community Health Nursing Practicum I (3G)
NUCN 6406 Community Health Nursing Practicum II (3G)
NURS 6962 Thesis/Project (3G)

Eight to nine semester hours are required in cognate courses:

Cognate Courses (8-9 hours)
HLED 6189 Community Epidemiology (3G)
MHAD 6125 Finance in Health Administration (3G)
Elective (2-3G)

Specialty Concentration for Family Nurse Practitioner

The Family Nurse practitioner (FNP) concentration prepares advanced practice nurses to deliver primary care to families across the life span. The concentration underscores the needs of culturally diverse families in rural and medically underserved areas and equips students to provide comprehensive care in the following areas: prevention, health maintenance, and health promotion. Graduates of this program are eligible to take the American Nurses' Association credentialing examination for FNPs and will be approved to practice as FNPs in North Carolina.

Additional Admission Requirements. In addition to the general requirements for admission to the Graduate School, and the MSN degree program, the following are required:

1. Two years of recent clinical practice
2. The Graduate Record Exam (GRE) (score of 500 on each of 2 of the 3 sections) or the Graduate Management Admission Test (GMAT) (score of 40 or above).

3. Vitae that includes any presented papers, publications, honors, membership in professional organizations and community activities.
4. A statement of purpose that explains the applicant's career goal.
5. Demonstrated involvement in community service.
6. A commitment to practice sufficient hours to meet recertification requirements.
7. Personnel interview.

Degree Requirements. The concentration requires completion of 49 semester hours in approved courses, including core courses:

Core Courses (15 hours)
NURS 6101 Theoretical Basis for Nursing Practice (3G)
NURS 6160 Research in Nursing and Health Professions (3G)
NURS 6962 Thesis/Project (3G)
NURS 6115 Health Policy and Planning in the U.S. (3G)
RSCH 6110 Inferential Statistics (3G)

Thirty-four semester hours are required in specialty courses:

Specialty Concentration (34 hours)
BIOL 6050 Advanced Human Physiology (3G)
BIOL 6050 Advanced Human Pathophysiology (3G)
NURS 6210 The Family and Health (3G)
NURS 6220 Pharmacotherapeutics in Advanced Nursing Practice (3G)
NURS 6230 Health Assessment and Diagnostic Reasoning for Advanced Nursing Practice (3G)
NUNP 6240 Advanced Primary Care of Women (5G)
NUNP 6250 Advanced Primary Care of Adults (5G)
NUNP 6260 Advanced Primary Care of Children and Adolescents (5G)
NUNP 6400 Internship in Family Health Nursing (4G)

Specialty Concentration in Adult Psychiatric Mental Health Nursing

The Adult Psychiatric Mental Health Clinical Nurse Specialist track is designed to allow students to provide specialized psychiatric care and consultation to seriously and chronically mentally ill adults. Graduates of this program will be prepared to complete requirements for certification as a Clinical Specialist in Adult Psychiatric and Mental Health Nursing.

Degree Requirements. This program requires 42 semester hours as follows:

Prerequisite: Computer Competency (0)

Core Courses (15 hours)
NURS 6160 Research in Nursing and Health Professions (3G)
NURS 6101 Theoretical Basis for Nursing Practice (3G)
NURS 6962 Thesis/Project (3)
NURS 6115 Health Policy and Planning in the U.S. (3G)
RSCH 6110 Inferential Statistics or Equivalent (3G)

Specialty Concentration (18 hours)
NUMH 6200 Psychiatric Mental Health Theories and Constructs of Mental Health Care (3G)
NURS 6201 Advanced Care in the Community (3G)
NUMH 6130 Advanced Psychiatric Mental Health Nursing Practice with Individuals (4G)
NUMH 6135 Advanced Psychiatric Mental Health Nursing Practice with Groups and Communities (4G)
NUMH 6401 Internship in Advanced Psychiatric Mental Health Nursing Practice (4G)

Cognate Courses (9 hours)
PSYC 6015 Topics in Perception and Physiological Psychology (3G)
NURS 6220 Pharmacotherapeutics for Advanced Nursing Practice (3G)
NURS 6230 Health Assessment for Advanced Nursing Practice (3G)

Master of Science in Nursing and Master of Health Administration

Degree: MSN/MHA

The Master of Science in Nursing and Master of Health Administration program is an interdisciplinary dual degree program designed to prepare nurse executives. This program enables baccalaureate prepared nurses to pursue a degree option which combines the areas of nursing and health care administration. Applicants musts be admitted to and satisfy requirements for both programs.

Additional Admission Requirements. In addition to the general requirements for admission to the Graduate School, the following are required for graduate study in the MSN/MHA program:

1. BSN degree from an NLN accredited program with an overall GPA of at least 3.0 (on a 4.0 scale) on all previous work beyond high school.
2. Current unencumbered licensure as a Registered Nurse.
3. Satisfactory performance on the Graduate Record Exam (GRE), Miller's Analogies Test (MAT), or the Graduate Management Admission Test (GMAT). (Not required for applicants who hold another graduate degree; e.g. MBA, MSW, MD)
4. Essay describing the applicant's experience and objective in undertaking graduate study.
5. Basic computer skills including the use of word processing, spread sheet and data base software.
6. A course in basic accounting is a prerequisite for Accounting for Health Care Management, but does not have to be completed before admission.

Degree Requirements. The MSN/MHA degree requires 51 credit hours of courses offered through the Colleges of Nursing and Health Professions, Arts and Sciences, and Business Administration. Additionally each student will complete a 150-hour practicum experience in nursing administration:

The following courses are required in nursing and health administration:

RSCH 6110 Inferential Statistics (3G)
NURS 6101 Theoretical Basis for Nursing Practice (3G)
NURS 6160 Research in Nursing and the Health Professions (3G)
NURS 6152 Information Resource Management (3G)
NUCN 6201 Advanced Nursing Care in the Community (3G)
NUNA 6175 Theory and Application of Administration to Nursing Systems (3G)
NUNA 6490 Advanced Practicumm in Nursing Administration (3G)
HLED 6189 Community Epidemiology (3G)
NURS 6962 Thesis/Project (3G)
NURS 6115 Health Policy and Planning in the U.S. (3G) **OR**
HADM 6112 Introduction to the U.S. Health Care System (3G)

The following courses are required in health dministration:

HADM 6114 Economics of Health Policy (3G)
HADM 6123 Accounting for Health Care Management (3G)
HADM 6125 Finance in Health Care Administration (3G)
HADM 6130 Health Law and Ethics (3G)
HADM 6145 Organization Theory and Leadership (3G)
HADM 6147 Human Resource Management (3G)
HADM 6166 Strategic Management of Health Services Organizations (3G)

Health Promotion

Degree: M.Ed. *Coordinator: Tim Lightfoot*

MASTER OF EDUCATION DEGREE IN HEALTH EDUCATION

Health promotion, as an area of study, emphasizes that individuals can make choices which will (1) allow them to function at a higher level; (2) reduce the risks of disease, injury, impairment or dysfunction; and (3) reduce the severity of disease by early recognition of symptoms. The health promotion program specifically teaches the knowledge and skills required to serve as a practitioner of health promotion. Graduates from the program work in a variety of capacities: health promotion specialists in community agencies, health departments, schools, colleges and universities, hospitals, clinics and worksite health promotion programs of business and industries.

Program Options. The program offers three options based on the population to be served:

The *school health option* focuses on the needs of students in grades K-12. Applicants to this option are required to be licensed to teach prior to admission. Graduate Teaching Certification in Health Education is awarded to graduates who complete this option.

The *worksite health promotion option* addresses the needs of worksite populations and is especially pertinent to business and industry, health fitness agencies and commercial ventures in health fitness/health promotion.

The *community option* targets the specific needs of communities and how to coordinate the efforts of the many agencies which dedicate resources to the improvement of community health.

Additional Admission Requirements. In addition to the general requirements for admissions to the Graduate School, the following are required for graduate study in Health Promotion:

1. A GPA of 3.0 or higher for the junior and senior undergraduate years and major program is preferred.
2. An acceptable score on either the Miller's Analogy Test or the Graduate Record Exam.
3. Commendable letters of reference. Letters from faculty members who are able to address academic competencies are preferred.
4. Although an undergraduate degree in a health field is not a prerequisite to admission, applicants must have completed Human Anatomy and Physiology (BIOL 1273, 1274) prior to admission. Completion of General Chemistry (CHEM 1203, 1204) is also recommended.
5. Applicants to the school health option must have a teaching license.

In cases in which an applicant is not clearly admissible, but shows promise, conditional admission may be considered.

Degree Requirements. Candidates for the degree must successfully complete 36 approved graduate hours, including the core curriculum, at least one of the three program options, and specialty content courses and other electives.

Core Curriculum (18 hours)
HLED 6120 Philosophy and Practice in Health Promotion
HLED 6143 Behavior Change in Health Promotion
HLED 6145 Health Promotion Planning and Evaluation
HLED 6141 Health Promotion Administration
NURS 6160 Research Methods **OR**
RSCH 6101 Education Research Methods (with approval)
HLED 6471 Seminar and Internship in Health Education

A minimum of one-hundred contact hours is expected for each three hours of internship credit. *It is strongly recommended that HLED 6120, 6143, 6145 and 6141 be completed in sequence.*

School Health Option (3 hours):
HLED 6151 Coordinating the School Health Program

Community Health Option (6 hours):
HLED 6160 Community Health Promotion
HLED 4299 Epidemiology **OR**
HLED 6189 Community Epidemiology

Worksite Option (6 hours):
HLED 6153 Worksite health Promotion
HLED 6134 Assessment and Development of Physical Fitness

Content Specialty Courses:
HLED 5120 Mental and Emotional Well-being
HLED 5124 Safety Through the Life Span
HLED 5126 Adolsecent Sexuality and Family Life
HLED 5128 Environmental Health: A Global Perspective
HLED 5130 Applied Nutrition for Today's Consumer
HLED 5122 Responsible Drug Use in Contemporary Culture

Students are encouraged to work with their advisers to develop targeted competencies and specialties. A grade of B or higher is required for thirty of the thirty-six hours and a minimum grade of C is required for the remaining six hours. A minimum of eighteen hours must be taken in courses numbered at the 6000-level or higher.

Comprehensive Examination or Thesis. A culminating experience of either a comprehensive examination or a thesis is required. Students interested in pursuing a doctoral degree are advised to take a course in statistics and write a theses. Comprehensive exams are given only in the fall (first Saturday in October) and the spring (first Saturday in March) from 8:00 AM - 5:30 PM. A student must have completed thirty hours by the beginning of the semester in which the examination is scheduled to be eligible to take the exam. A student must be enrolled in a class or registered for HLED 7999 the semester they take the comprehensive exam.

Graduate Assistantships. The Department has a very limited number of graduate teaching assistantships. There also are graduate assistantships in non-academic units that are reserved for health promotion students recommended by health promotion faculty members.

Other Financial Assistance. Funds also are available as student wages for specific work and, at times, through faculty grants, paid internships and off-campus jobs at health promotion organizations which depend on the Department to recommend potential employees.

Operations Research

INTERDISCIPLINARY GRADUATE MINOR

The interdisciplinary graduate minor in Operations Research is designed to provide advanced problem solving skills and knowledge in the general areas of operations research and optimization to enable their application to effectively address the present-day problems of business, management science, engineering and computer science. This program prepares students for studies leading to the Ph.D. degree. The required courses are offered by the participating departments of Electrical Engineering, Civil Engineering, Computer Science, Mechanical Engineering, Economics, and Information&Operations Management.

Admission Requirements. Students admitted to graduate degree programs in the participating departments and the M.B.A. program who are in good standing, are eligible for the minor in Operations Research.

Requirements for the Minor

1. Declaration of the minor, preferably by the end of the first semester of graduate study.
2. Formation of a Program Committee: Students who elect to minor in Operations Research will select a participating faculty member as a member of their regular graduate committee. A list of participating faculty will be available from the coordinator of the minor in Operations Research.
3. Fulfill the requirements of a participative degree program and complete OPRS 6101 and one course each from two of the following areas selected with the advice and knowledge of the student's program committee.

   Mathematics: OPRS 4113, 4114, 5111, 5112 MATH 5165, 7125, 7177 and topics: reliability theory, queuing models, variational methods.

   Computer Science: CSCI 5131, 5150, 6160, 6166

   Management Information Systems and Operations Management: MBAD 6121, 6122, 6141

   Economics: ECON 4100, 4112

   Electrical Engineering: EEGR 6111, 6112, 6115, 6116

   Civil Engineering: CEGR 5090, 6181

4. Students must have a cumulative 3.0 GPA in courses applied to the minor. Course waivers and transfer credit will be considered on an individual basis.

Physics

Degree: M.S. *Coordinator*: Terrill W. Mayes

MASTER OF SCIENCE DEGREE IN APPLIED PHYSICS

The Master of Science program in Applied Physics offers both thesis and non-thesis degree options. While students have opportunities for research in several areas, the research emphasis of faculty in the department is in the area of applied optics. Primary areas of research include: opto-electronic devices and systems, optical sensors, near-field optics, fiber optics, laser spectroscopy, and biomedical optics. A description of research in these and other areas is available electronically at http://www.physics.uncc.edu.

Additional Admission Requirements. In addition to general requirements for admission to the Graduate School, applicants seeking admission into the physics graduate program must also:

1. Possess a Bachelor's degree in Physics, or equivalent, from an accredited college or university.
2. Present satisfactory scores on the aptitude and physics specialty portion of the Graduate Record Examination.
3. Possess an overall GPA of at least 2.75 on all of the applicant's work beyond high school. The GPA in the major should be 3.0 or better.
4. Present satisfactory scores on the Test of English as a Foreign Language, if the applicant is from a non-English speaking country.
5. Demonstrate evidence of sufficient interest, ability, and preparation in physics to adequately profit from graduate study, as determined by the Physics Department's Graduate Committee.

Degree Requirements. The Master of Science degree in Applied Physics requires the completion of 30 hours of coursework approved by the Physics Department and may include up to 12 semester hours from such related areas as Mathematics, Chemistry and Engineering. A candidate for the degree must present credit for PHYS 4222, PHYS 4232, PHYS 4242, and at least 15 semester hours in physics courses numbered 6000 and above. Courses for which undergraduate credit has been awarded may not be repeated for graduate credit. Students may select between a thesis and non-thesis option. A student selecting the thesis option must complete at least 6 semester hours of Physics Thesis Research, PHYS 6900, as part of the required coursework.

A minimum GPA of at least 3.0 is required on all coursework attempted for the degree. At the time of admission up to 6 semester hours of graduate transfer credit may be accepted if approved by the Physics Department and the Graduate School.

Comprehensive Examination. All candidates for the degree must pass a final examination.

Assistantships. Support for graduate students is usually in the form of teaching assistantships for beginning students and research assistantships for continuing students.

Interdisciplinary Ph.D. Option. The Physics Department, in conjunction with the Departments of Electrical and Mechanical Engineering, offers an option for students who have completed the Master of Science program in Applied Physics to pursue studies leading to a Ph.D. in those areas of applied optics that relate to optoelectronics, microelectronics, precision engineering, or materials engineering. Students choosing to work in optoelectronics or microelectronics would receive the Ph.D. in Electrical Engineering; those working in precision engineering or materials engineering would receive a Ph.D. in Mechanical Engineering. Students selecting this option would pursue a course of study that includes work in both the Physics Department and one of the two engineering departments. Opportunities in this area are available from the Graduate Coordinator for the Physics Graduate Program or electronically at http://www.physics.uncc.edu.

Psychology: Clinical/Community

Degree: M.A. *Coordinator*: James R. Cook

MASTER OF ARTS DEGREE IN PSYCHOLOGY

The objective of the master's degrec program in Clinical/Community Psychology is to train psychologists in the knowledge and skills necessary to address problems encountered in modern living. The program provides a foundation in the research methods and content of basic psychology as well as training in the applied skills of professional practice. The relatively small, competitively selected student body receives individual attention from faculty members who maintain rigorous standards of academic excellence.

Students develop knowledge and skills in psychological assessment, learn various treatment and intervention strategies, and work with a variety of populations in consultation, evaluation and research. An extensive practicum component utilizes the Charlotte area as a setting for applied experience.

The program prepares students for the North Carolina psychology licensure exam and for positions in diverse settings such as community mental health centers, correctional facilities, and other human service programs. A number of graduates have gone on to pursue a doctoral degree.

Additional Admission Requirements. To be considered for admission to graduate study in psychology, a student must present the following requirements in addition to those required by the Graduate School:

1. Completed application by March 15
2. 18 hours of undergraduate psychology including Introductory Psychology & Research Methods
3. An undergraduate course in Statistics
4. Acceptable scores on the Verbal and Quantitative GRE
5. Acceptable scores on the advanced GRE test in psychology

Admission to the program is very competitive for the 10 students entering the program each year. Most students who are admitted have much better records than the minimum required. The primary application deadline is March 15 for admission in the fall semester, but if space is still available, late applications will be considered until July 1. Students may not begin the program during the spring semester.

Degree Requirements: The Clinical/Community Psychology program requires at least 48 semester hours of graduate coursework. Full-time students should be able to complete the program in two calendar years. A thesis and comprehensive examination are required.

Basic Knowledge and Methods in Psychology (14 hours)

PSYC 6102	Research Design and Quantitative Methods in Psychology (3G)
PSYC 6107	Ethical and Professional Issues in Psychology (2G)
PSYC 6999	Thesis (3G)

and two courses (6 hours) selected from the following:

PSYC 6010	Topics in Learning and Cognition (3G)
PSYC 6015	Topics in Perception and Physiological Psychology (3G)
PSYC 6020	Topics in Development Psychology (3G)
PSYC 6030	Topics in Social Psychology and Personality (3G)

Clinical/Community Coursework (34 hours)

PSYC 6050	Topics in Psychological Treatment (3G)
PSYC 6141	Intellectual Assessment (4G)
PSYC 6142	Personality Assessment (4G)
PSYC 6145	Applied Research Design and Program Evaluation (3G)
PSYC 6150	Psychological Treatment (4G)
PSYC 6151	Behavior Disorders (4G)
PSYC 6155	Community Psychology (3G)
PSYC 6450	Practicum in Clinical Psychology (3G)
PSYC 6455	Practicum in Community Psychology (3G) **OR**
PSYC 6450	Practicum in Clinical Psychology (3G)
Elective	(Selected in consultation with adviser.) (3G)

Hours beyond the 48 hours may be required by the academic adviser and the Clinical/Community Program Committee. The faculty conduct a thorough review of student performance on a regular basis. Continuation in the program is contingent upon a favorable review during these evaluations. Students who consistently show borderline course performance, who are not developing good applied skills in the practice of psychology, who fail to complete coursework on a timely basis, or who otherwise perform unprofessionally or unsatisfactorily, may be required to complete additional courses or practicum work, or may be removed from the program.

Comprehensive Examinations. All students are required to complete successfully comprehensive examinations covering research design, ethics and knowledge of clinical/community psychology. Students who fail the comprehensive exam twice are removed from the program.

Assistantships. A variety of resources are available for financial assistance. These include teaching assistantships for general psychology laboratory, research assistantships for faculty grants, and graduate assistantships in other campus units such as the Learning Assistance Center and Disabled Student Services. These range in pay from $5400 to $8750 per academic year.

Research Experiences. Students are encouraged to become involved in ongoing research in the department, and they are required to complete a thesis.

Practica. Practica, involving practical experience working with human service agencies in the region, are a required part of the program.

Psychology: Industrial/Organizational

Degree: M.A. *Coordinator:* Jo Ann Lee

MASTER OF ARTS DEGREE IN PSYCHOLOGY

The objective of the master's degree program in Industrial/Organizational Psychology is to train psychologists in the knowledge and skills necessary to address problems encountered in work organizations. The program provides a foundation in the research methods and content of basic psychology as well as training in the applied skills of professional practice. Students in the Industrial/Organizational concentration develop knowledge and skills pertaining to people at work, including personnel selection and design and evaluation of programs, such as programs for training employees, increasing performance, enhancing quality, reducing conflict and enhancing job satisfaction. The relatively small, competitively selected student body receives individual attention from faculty members who maintain rigorous standards of academic excellence.

Additional Admission Requirements. To be considered for admission to graduate study in psychology, a student must present the following requirements in addition to those required by the Graduate School.

1. Completed application by March 15
2. 18 hours of undergraduate psychology including: Introductory Psychology, Research Methods, and an undergraduate course in statistics
3. GPA above 2.8 overall and 3.0 in psychology
4. Satisfactory GRE scores, including the Advanced GRE test in psychology

These are minimum standards. Admission to the program is very competitive for the fewer than fifteen spaces in the program available each year. The primary application **deadline is March 15** for admission in the fall semester, but if space is available, late applications will be considered until July 1. Students may not begin the program during the spring semester.

Degree Requirements. The Industrial/Organizational program requires at least 48 semester hours of graduate coursework as specified below. Full-time students should be able to complete the program in two calendar years. The enrollment of a student who receives three grades of *C* or one *Unsatisfactory* grade during his or her graduate career is automatically terminated.

Basic Knowledge and Methods in Psychology (14 hours)
PSYC 6102 Research Design and Quantitative Methods in Psychology (3G)
PSYC 6107 Ethical and Professional Issues in Psyc. (2G)
PSYC 6999 Thesis (3G)
and two courses selected from the following:
PSYC 6010 Topics in Learning and Cognition (3G)
PSYC 6015 Topics in Perception and Physiological Psychology (3G)
PSYC 6020 Topics in Development Psychology (3G)
PSYC 6030 Topics in Social Psyc. and Personality (3G)

Industrial/Organizational Psychology (22 hours)
PSYC 6140 Psyc. Measurement and Evaluation (3G)
PSYC 6171 Industrial/Organizational Psychology (3G)
PSYC 6171L Laboratory in I/O Psychology (1G)
PSYC 6172 Personnel I (3G)
PSYC 6174 Organizational Dynamics I (3G)
PSYC 6175 Organizational Dynamics II (3G)
PSYC 6177 Personnel II (3G)
PSYC 6477 Projects in I/O Psychology (3G)

Electives selected in consultation with Adviser (12 hours)
PSYC 6124 Psychology of Aging (3G)
PSYC 6173 Individual Dynamics (3G)
PSYC 6176 Counseling in Organizations (3G)
PSYC 6899 Readings and Research (3G)
Graduate courses from other disciplines

The faculty will conduct a thorough review of student performance on a regular basis. Continuation in the program is contingent upon a favorable review during these evaluations. Students who consistently show borderline course performance, who fail to complete coursework on a timely basis, or who otherwise perform unprofessionally or unsatisfactorily may be required to complete additional courses or may be removed from the program.

Comprehensive Examinations. All students are required to complete successfully comprehensive examinations covering research design, ethics, and information related to Industrial/Organizational Psychology. A student who fails the comprehensive exam twice will be removed from the program.

Assistantships and other Financial Assistance. A variety of resources are available for financial assistance. These include teaching assistantships to proctor the general psychology laboratory, research assistantships to assist on faculty grants, and graduate assistantships in psychology and other campus units such as the Learning Assistance Center and the University Honors Office. These range from $5600 to $8400 per academic year. Information on loans, grants and employment opportunities is available from the Financial Aid Office.

Research Experiences. In addition to the completion of a thesis, students have the opportunity to work with individual faculty members on their research. The Department of Psychology has an energetic and dynamic faculty of more than 30 psychologists who are committed to education and have established an excellent record of productivity in all the major areas of psychological research and professional practice.

Practica. An extensive practicum component utilizes the Charlotte area as a setting for applied experience. All students must complete 3 hours of Projects in I/O Psychology (PSYC 6477) and they are strongly encouraged to take 6 hours.

Public Administration

Degree: M.P.A. *Coordinator*: Gary R. Rassel

MASTER OF PUBLIC ADMINISTRATION

The primary objective of the Master of Public Administration (M.P.A.) degree program is to provide professional training in public administration. The curriculum emphasizes the analysis of the political and administrative environments as well as the administrative decision-making approaches of public administration. Application of techniques and administrative skills to the management of nonprofit organizations is also included in the curriculum.

The methods of instruction employed in the program expose students to a variety of approaches to public management. These

nethods include simulations, role playing, problem analysis, ectures and case studies. The ability to analyze complex nanagerial problems is best developed by combining heoretical principles and practical administrative experience ınd the instructional program is designed to enable the ;tudent to achieve this combination.

Students may enroll in the Master of Public Administration program on either a full-time or part-time basis. The majority of classes are scheduled in the evening throughout the year. However, some classes are scheduled on Saturdays and during the afternoon. Classes meet on the main campus and at UNC Charlotte Uptown. Full-time students may carry more than a normal course load only with permission of their advisers.

Additional Admission Requirements. In addition to the general requirements for admission to the Graduate School, the following are required for full admission to graduate study in Public Administration:

1. An acceptable score on the aptitude portion of the Graduate Record Exam or the Miller Analogies Test.
2. An undergraduate GPA of at least 3.0 on a 4.0 scale.
3. Completion of the following undergraduate courses or their equivalents: POLS 1110 (Introduction to American Government); STAT 1222 (Elementary Statistics for the Social Sciences); and demonstrated proficiency in basic computer applications.

Applicants not meeting these requirements may be considered for conditional admission.

Degree Requirements. The Master of Public Administration program is structured into three phases: I. Core; II. Advanced Work; and III. Directed Study.

I. Core (19 hours): The core emphasizes achieving an overall perspective on the problems of public administration and comprehending the various managerial and analytical approaches salient to the environment of public administration. It includes:

MPAD 6102 Legal and Institutional Foundations of Public Administration (3G)
MPAD 6104 Theoretical and Ethical Foundations of Public Administration (3G)
MPAD 6125 Quantitative Research Methods in Public Administration (3G)
MPAD 6125L Computer Lab in Quantitative Research Methods in Public Administration (1G)
MPAD 6128 Public Policy Analysis and Program Evaluation (3G)
MPAD 6131 Public Budgeting and Finance (3G)
MPAD 6134 Human Resources Management (3G)

After completion of the core requirements each student must successfully complete a comprehensive examination.

II. Advanced Courses (15 hours): The advanced courses include application of analytic tools and understanding of public administration processes. With the approval of an adviser, students may elect to take advanced work with other departments. Students are expected to complete MPAD 6187 and select four courses from the following:

MPAD 6000 Topics for Graduate Study in Public Administration (1-4G)
MPAD 6140 Labor Mgmt. Relations in Government (3G)
MPAD 6141 Conflict Mgmt. in Public Organization (3G)
MPAD 6142 Managing Grants and Contracts in the Public Sector (3G)
MPAD 6144 Changing the Public Organization (3G)
MPAD 6146 Introduction to Urban Administration (3G)
MPAD 6160 Info. Systems in Public Administration (3G)
MPAD 6172 Administration of the Health Care Systems in the United States (3G)
MPAD 6174 Public Policy and Politics in Health Care Administration (3G)
MPAD 6176 Trends and Issues in Health Admin. (3G)
MPAD 6185 Intergovernmental Relations (3G)
MPAD 6210 Aging and Public Policy (3G)
MPAD 6211 Administration of Aging Programs (3G)

Capstone Seminar. Students are required to complete MPAD 6187 (Advanced Seminar in Public Management Problem Solving) as a capstone course after successfully completing the comprehensive examination.

III. Directed Study or Research (6 hours):

Each MPA student must complete either option A or B:

A. Directed Study. Students who select this option will complete a written project on a topic of significance based on a field experience in public administration or nonprofit administration. The field experience requirement can be satisfied by student experience gained through professional involvement in public or nonprofit administration or experience gained through an approved internship. The Directed Study requires these courses, graded on a Pass/Fail basis:

MPAD 6800 Directed Study in Public Administration (Proposal) (3G)
MPAD 6801 Directed Study in Public Administration (Completed Study) (3G)

University regulations governing the preparation and submission of Master's theses also apply to the Directed Study.

B. Research Applications. Students who select this option will complete a one-semester written project on an approved topic of significance in public administration or nonprofit administration. The project will include the submission of revised paper drafts based on instructor evaluation. Students must enroll in the following course graded A, B, C, U format:

MPAD 6188. Research Applications in Public Administration (3G)

Students who select this option must take one additional elective course to complete the 40 hours required for the MPA degree.

Comprehensive Examination. Upon completion of the core courses, each student must successfully complete a written comprehensive examination designed to test knowledge and/or skills of administrative analysis and administrative theory and practice. It is the responsibility of the student to take the requisite courses and the comprehensive examination in a timely fashion. All MPA core courses are offered at least once during the fall, spring, or summer semesters.

Assistantships. The department offers a number of graduate assistantships each academic year. To apply for an assistantship, students must submit a completed "Application for Graduate

Assistant" form and a copy of their resume to the MPA coordinator.

Internships. Each student in the Master of Public Administration Program is required to complete a field experience. This requirement may be satisfied in one of three ways: (1) through a full-time position in a public or nonprofit organization; (2) through a full-time position in a business where the work experience is approved for internship; or (3) through an approved internship in a public or nonprofit organization. Each student must complete an "MPA Internship Information" form and submit it to the MPA office.

Scholarship. (1) The North Carolina City and County Management Association funds a public administration scholarship at each of the state universities to help train students for careers in North Carolina local government. The MPA Program selection committee nominates the eligible recipient each fall. (2) Burkhalter Alumni Scholarship. The MPA Alumni Association has established a scholarship fund to honor a former Charlotte City Manager. (3) A limited number of partial tuition awards are made available through the Graduate School.

Sociology

Degree: M.A. *Coordinator*: Murray Webster

MASTER OF ARTS DEGREE IN SOCIOLOGY

The Master of Arts degree in Sociology provides students with the theoretical and methodological skills necessary to undertake analysis of contemporary social issues and problems. The program is designed to accommodate both full-time and part-time graduate students, and classes are held in the evenings to serve students who are currently employed.

The concentration in *Applied Social Research* is designed to meet the needs of students seeking master's level research skills in occupations requiring this expertise, such as government, marketing, program planning and evaluation, business, the media, and the non-profit sector. Coursework concentrates on building skills in research design, sampling, data analysis and interpretation, and application of sociological theory. In addition, students may concentrate in one of three thematic areas: *Education and Health, Family and Aging,* and *Violence and Conflict Resolution.* These thematic areas do not prevent students from pursuing other areas of interest. Students seeking a broader-based education in sociology to prepare for further graduate training or teaching positions in community colleges also are accommodated.

Additional Admission Requirements. In addition to the general requirements for admission to the Graduate School, the following are required for graduate study in Sociology:

1. An overall undergraduate GPA of 3.0 or better.
2. An acceptable score on the Aptitude Portion of the Graduate Record Examination (GRE).
3. Completion of a minimum of 18 hours in undergraduate coursework in the social sciences, including social theory.
4. Demonstrated undergraduate competence in research methods and statistics for social research.

Applicants who fall below one of these criteria and otherwise appear as promising candidates may be admitted on a conditional status by recommendation of the Sociology Graduate Committee.

Degree Requirements. The program requires 35 semester hours of coursework including 18 hours of core courses to provide all students with a solid foundation in theory and methods of sociological inquiry along with applied social research skills. The core curriculum consists of SOCY 5151, 6651, 6652, 6653, 6615 and 6617. Students are required to take six semester hours in SOCY 6895 (thesis) or 6897 (research practicum).

Students may choose a thesis option with an oral defense or a research practicum with an oral defense. The thesis option includes 11 hours of electives and 6 hours of thesis credits. The research practicum includes 11 hours of electives and 6 hours of research practicum credits where the student works directly with an organization or agency in the community and develops a consultant-client relationship whereby the student conducts a research/evaluation project on behalf of the agency or organization. A final report or research paper will be submitted, which is subject to all University regulations governing the preparation and submission of Master's theses.

At least 29 of the 35 hours required must be taken in courses open only to graduate students. With departmental approval, students may transfer up to six semester hours of graduate work graded a B or better from another accredited institution or related UNC Charlotte program.

Assistantships. Several teaching assistantships are available on a competitive basis each year. To be fully competitive applications must be received by April 1. Further information is available from the graduate coordinator.

Internships. Several paid internships are available on a competitive basis for the calendar year. These are determined by the agency offering the internship in consultation with the internship coordinator. Further information is available from the graduate coordinator.

INTERINSTITUTIONAL MASTER'S DEGREE PROGRAMS

The University of North Carolina at Charlotte participates in two interinstitutional master's degree programs: the Master of Social Work (M.S.W.) with the University of North Carolina at Chapel Hill which confers the degree, and the Master of Library Science (M.L.S.) with the University of North Carolina at Greensboro which confers the degree.

INTERINSTITUTIONAL DOCTORAL DEGREE PROGRAMS

The University of North Carolina at Charlotte participates in an interinstitutional degree program, the Doctor of Philosophy (Ph.D.) in engineering degree program, with North Carolina State University which confers the degree.

Other Courses Carrying Graduate Credit

Several departments within the College of Arts and Sciences, the College of Business Administration, and the College of Education offer courses carrying graduate credit in areas that do not offer a graduate degree program.

Areas of study, listed alphabetically, are: African-American and African Studies, Anthropology, Communication Studies, Foreign Languages (French, German, and Spanish), Philosophy, Political Science, Religious Studies, and Women's Studies.

COURSE DESCRIPTIONS

Course Descriptions. Course descriptions provide the following information: subject prefix; course number; course title; any of the Goals of UNC Charlotte Education that the course satisfies (**A**= Arts, C=Individual, Society and Culture, **L**=Literature, **O**= Oral Communication; **P**=Problem-solving, **S**=Science, **V**=Values, **W**=Writing Intensive, **X**=Cross-Cultural); semester credit hours assigned to the course; prerequisites and/or corequisites (if any); brief description of the course content; and when the course usually is offered (Evenings, Yearly, Alternate years, Fall, Spring, Summer, On demand). The description may specify the number of class (lecture) and/or laboratory sessions and hours. If no class hours are given, the number of class hours per week is the same as the number of semester hours credit assigned to the course. For example:

> **SUBJ 1234. Title of Course. (Goals Met) (Credit Hours)** Pre/corequisites. Brief description of course content. (Three lecture hours and one three-hour laboratory per week) (When offered)

Course Numbering System. Courses are identified by four-digit numbers. The first digit indicates the level of the course: **1000-2999:** lower-division undergraduate; **3000-3999:** upper-division undergraduate; **4000-4999:** upper-division undergraduate and graduate; **5000-5999:** graduate and advanced undergraduate; **6000-7999:** graduate only; **8000-8999:** doctoral only. The following second digits designate special types of courses: **0** for topics; **4** for internships and practica, **5** for cooperative education, **6** for seminars, **7** for honors courses, **8** for independent study, and **9** for research.

Undergraduate/Graduate Course Requirements. Additional work is required of graduate students enrolled for graduate credit in **4000-level** courses. Undergraduate students permitted to enroll in **5000-level** courses are expected to complete the same assignments and to be graded on the same scale as the graduate students in the course. To enroll in a **5000-level** course, an advanced undergraduate student must have senior standing, an overall GPA of at least 3.0, and permission of the instructor. Courses numbered **6000 and higher** are for graduate students only. Graduating seniors may be permitted to enroll in these courses in accordance with the *Dual Undergraduate/ Graduate Registration Policy* described in this *Catalog*.

Course Prefix. Courses offered for academic credit are listed by number within each subject and the **subjects are listed alphabetically according to prefixes** which are assigned as follows:

Subject	Prefix
African-American and African Studies	AAAS
Accounting	ACCT
Educational/School Administration	ADMN
Aerospace Studies	AERO
American Studies	AMST
Anthropology	ANTH
Architecture	ARCH
Arts and Sciences	ARSC
Art: Academic & Departmental	ARTA
Art: Basic Foundation Studios	ARTB
Art: Ceramics	ARTC
Art: Drawing	ARTD
Art: Education	ARTE
Art: Fiber	ARTF
Art: Graphic Design	ARTG
Art: Illustration	ARTL
Art: Multi-Media	ARTM
Art: Painting:	ARTP
Art: Printmaking	ARTR
Art: Time Arts/Photography	ARTT
Art: Sculpture	ARTZ
Biology	BIOL
Business Law	BLAW
Business Honors	BUSN
Civil Engineering	CEGR
Chemistry	CHEM
Child and Family Development	CHFD
Civil Engineering Technology	CIET
Criminal Justice	CJUS
Communication Studies	COMM
Computer Engineering	CPGR
Computer Science	CSCI
Counseling and Guidance	CSLG
Curriculum and Instruction	CURR
Dance	DANC
Dance and Theatre	DATH
Economics	ECON
Education	EDUC
Electrical Engineering	EEGR
Engineering Technology	EGET
Education Instructional Systems Technology	EIST
Elementary Education	ELED
Electrical Engineering Technology	ELET
English	ENGL
Engineering	ENGR
Earth Sciences	ESCI
Engineering Science	ESGR
Finance	FINN
Foreign Language	FORL
French	FREN
Geography	GEOG
Geology	GEOL
German	GERM
Greek	GREK
Gerontology	GRNT
Health Administration	HADM
History	HIST
Health Education	HLED
University Honors	HONR
Industrial Engineering Technology	INET
Management Information Systems	INFO
Japanese	JAPN
Journalism	JOUR
Latin	LATN
Liberal Studies	LBST
Liberal Engineering	LEGR
Mathematics Education	MAED
Mathematics	MATH
Master of Business Administration	MBAD
Middle Grades Education	MDLG
Middle, Secondary, and K-12 Education	MDSK
Mechanical Engineering Technology	MEET
Mechanical Engineering	MEGR
Manufacturing Engineering Technology	MFET
Management	MGMT
Marketing	MKTG
Public Administration	MPAD
Military Science	MSCI
Museum Studies	MSTS
Music	MUSC
Nursing: Adult Health	NUAH
Nursing: Anesthesia	NUAN
Nursing: Chronic Illness	NUCI
Nursing: Community	NUCN
Nursing: Mental Health	NUMH
Nursing: Administration	NUNA
Nursing: Parent-Child	NUPC
Nursing: R.N.	NURN
Nursing	NURS
Operations Management	OPER
Operations Research	OPRS
Physical Education	PHED
Philosophy	PHIL
Physics	PHYS
Political Science	POLS
Psychology	PSYC
Reading	READ
Religious Studies	RELS
Research	RSCH
Russian	RUSS
Secondary Education	SECD
Sociology	SOCY
Social Work	SOWK
Spanish	SPAN
Special Education	SPED
Statistics	STAT
Teaching English as a Second Language	TESL
Theatre	THEA
Translating	TRAN
Women's Studies	WMST

AFRICAN-AMERICAN AND AFRICAN STUDIES (AAAS)

Undergraduate

AAAS 1100. Introduction to African-American and African Studies. (X) (3) A multicultural focus on contemporary societies that include black people and the methodology, key issues and themes in African- American and African Studies. Readings on the experiences of black people in their interaction with other cultures in Africa, America and Europe. (*Fall, Spring*)

AAAS 1101. The Black Experience I. (3) Personal development of Black awareness; opportunities for exploration of self-definition; and development of inter-personal relationship skills. Effective community dialogue and action; creation and facilitation of community involvement experience required. (*Fall, Spring*)

AAAS 1102. The Black Experience II. (3) Prerequisite: AAAS 1100. Further personal development of Black awareness; student orientation to experience involving Black perspective; African-American experience as topic for study and examination. Community involvement experience required. (*Fall, Spring*)

AAAS 1103. The African Experience I. (3) Introductory survey of the history and culture of African peoples within the context of pre-colonial, colonial, and independent Africa. Focus on unique social, political, economic processes and problems in Africa. In-depth study of outstanding African leaders as representatives of their societies. (*Fall*)

AAAS 1104. The African Experience II. (3) Exploration of contemporary issues in Africa and their impact on African-Americans and other Africans in the diaspora. Impact of European colonization on Africa, including topics such as revolutionary and reform-oriented political movements, racism, imperialism, nationalism, urbanization, and Pan-Africanism. (*Spring*)

AAAS 1111. The African-American Experience Through Reconstruction. (3) African-American experience in America through Reconstruction. Topics include: system of slavery, free blacks in north and south, compromises with the peculiar institution, and impact of the civil war and reconstruction on the freedom, citizenship, and suffrage of African-Americans. (*Fall*)

AAAS 1112. The African-American Experience: Reconstruction Through the Present. (3) Prerequisites: AAAS 1100 and 1111 for majors and AAAS 1100 or 1111 for non-majors. An interdisciplinary survey of key issues, debates, and personalities in the African-American experience from 1865 to the present. *(Spring)*

AAAS 2105. Black Images in the Media. (3) Examination of African-American images projected through electronic and print media, historically and currently. (*Yearly*)

AAAS 2106. Literary Analysis of Black Protest of the 1960's (3) Selected African-American literary works examined as outgrowths of the 1960's protest movement. Poetry, drama and nonfiction of period studied. (*Spring*)

AAAS 2201. Introduction to Human Relations. (C) (3) Prerequisite: AAAS 1100. Understanding of self and others in a pluralistic society; analysis of theories of personal growth and interaction within the context of differing multi-ethnic values, mores and contributions. (*Fall, Spring*)

AAAS 2203. African-American Culture I. (3) Focus on the aesthetic dimensions of African-American culture through examination of aspects of literature, music, drama, art and dance. (*Fall*)

AAAS 2204. African-American Culture II. (3) Study of Black culture as manifested in social, political, economic and religious institutions through directed field work, lectures and research. (*Spring*)

AAAS 2205. African Culture I. (3) Survey of lifestyles in Africa with emphasis on the patterns of social behavior and communal organization that link and relate to the African-American experience and heritage. Research required. (*Fall*)

AAAS 2206. African Literature, Music and Art. (A) (3) Survey of African cultures through literature, music, drama, oral history and art with emphasis on the cultural undertones that link and relate the African-American experience and heritage. Creative research or community projects required. (*Spring*)

AAAS 2207. Introduction to Pan-Africanism. (3) Interdisciplinary study of Pan-Africanism. Examination of historical and contemporary efforts of peoples of African descent to unite their struggles for human advancement and equality in the United States, Latin America, Western Europe, and Africa, including critical review of popular movements, leading proponents and the significant organizational manifestations of Pan-Africanism. (*Alternate years*)

AAAS 2208. Education and African-Americans. (3) Examination of the problems and challenges of educating African-Americans. Topics include: conceptual approaches to education; historical and contemporary overview of education for African-Americans; the impact of race and discrimination; analysis of existing curricula; and suggested models for a multi-racial and multi-cultural education. (*Fall*)

AAAS 2215. Black Families in the United States. (W) (3) Critical and comprehensive examination of the life of African-American families in the United States including the historical evolution of black families and their relationship with the political-economic structures of American society. (*Yearly*)

AAAS 2221. Introduction to Contemporary Africa. (3) Study of Africa from 1960 to the present. Focus on political, economic, and social changes and Africa's integration into the community of nations. (*Fall*)

AAAS 3050. Topics in African-American and African Studies. (3) Treatment of a special topic. May be repeated for credit as topics vary, with approval of the Chairperson. (*Fall, Spring*)

AAAS 3101. Values in Racial Perspectives. (VX) (3) Study of values and make-up of American pluralistic society in historical and contemporary context. Focus on understanding of African- American values vis-a-vis those of majority society. *(Spring)*

AAAS 3150. Black Church/Civil Rights Movement. (VX) (3) Role of the black church in the struggle for human equality. Topics include radical, moderate, and accommodationist leadership styles; historical development of the black church in the South and its emergence as a foundation for the modern civil rights movement. **(Same as RELS 3150)** *(Fall)*

AAAS 3179. African-American Political Philosophy. (3) Prerequisite: 3000 level course on Africa from AAAS, POLS, or HIST. Analysis of competing ideologies in African-American political philosophy. **(Same as POLS 3172)** *(On demand)*

AAAS 3190. The Political Economy of the Caribbean. (3) An examination of the manifestations of Caribbean economic problems and policies and Caribbean political development from the post-war period to the present. *(Fall)*

AAAS 3230. Poverty and Discrimination. (3) Economic roots of poverty and discrimination and the impact of anti-poverty and anti-discrimination laws on Black America. *(Spring)*

AAAS 3250. Political Economy of Black America. (3) Examines the problems and the issues influencing the development of the black economic base in the United States and its role in the American economy. *(Fall)*

AAAS 3265. African Economic Development. (3) Focus on economic theories, planning, production, and resource allocation strategies, capital formation, foreign aid and multinational corporations in Africa. *(Yearly)*

AAAS 3290. Research Methods. (3) Prerequisite: completion of sophomore-year courses or instructor's permission. Design of a research project with emphasis on developing sound research skills and methods. *(Fall, Spring)*

AAAS 3601. Senior Seminar. (3) Prerequisite: completion of junior-year courses. Corequisite: AAAS 3990. Reading, discussion, reports. Peer critique of conceptualization, methodology and research of Senior Project. May be repeated for credit with consent of Advisory Committee. *(Fall, Spring)*

AAAS 3692. Colloquium. (W) (3) Prerequisite: consent of the instructor. A weekly colloquium; research and writing; opportunity for intellectual stimulation, critique and problem solving. Open to majors and non-majors. *(Fall, Spring)*

AAAS 3895. Independent Study. (1-3) Prerequisite: consent of the Department. Supervised investigation of a problem or subject in the area of African-American and African Studies. Majors only. May be repeated for credit. *(Fall, Spring)*

AAAS 3990. Senior Project. (2-15) Prerequisite: completion of junior-year courses. Corequisite: AAAS 3601. The writing of a senior research paper or work on a community-related project. Emphasis on mastery of skills and content of the discipline. (May be repeated twice for credit with instructor's consent.) *(Fall, Spring)*

Undergraduate/ Available for Graduate Credit

AAAS 4101. Modern African Literature in English. (3) (3G) Prerequisite: junior standing; AAAS 1100 or 2206 for AAAS majors. Topics included: traditional African and Western literary influences, the culture debate, post-independence satire, decolonization of African literature, apartheid, and women writers. *(On demand)*

AAAS 4102. Caribbean Literature in English. (3) (3G) Prerequisite: junior standing; at least one course in AAAS for AAAS majors. Topics include: loneliness, quest for identity, nationalism, protest, and the use of patois. *(On demand)*

AAAS 4103. Warfare, the Military and Civil Wars in Africa. (3) (3G) Prerequisite: 3000 or above course on Africa. Nature and conduct of warfare in ancient and modern times in Africa, including technology and strategy; analysis of events and institutions using military means such as civil wars, liberation and secession movements, the army, and their impact on African societies. *(On demand)*

AAAS 4105. Foreign Policy of African States. (3) (3G) Prerequisite: upper level course on Africa. A theoretical approach to the study of the external and internal factors influencing the development, implementation, and conduct of foreign policy of African States. **(Same As POLS 3169)** *(Spring)*

ACCOUNTING (ACCT)

Undergraduate

ACCT 2121. Principles of Accounting I. (3) Prerequisite: sophomore standing or consent of department. Fundamental accounting principles, with emphasis on the use of financial accounting data and analysis of financial statements. *(Fall, Spring, Summer) (Evenings)*

ACCT 2122. Principles of Accounting II. (3) Prerequisite: ACCT 2121 and sophomore standing or consent of department. An introduction to managerial accounting with an emphasis on using accounting information to make decisions. *(Fall, Spring, Summer) (Evenings)*

ACCT 3043. Current Developments in Accounting. (1-3) May be repeated for credit. Prerequisite: consent of the Department. A research project will be required. Topics will be selected from internal and external auditing, governmental accounting, income taxes, managerial accounting and accounting theory. *(Fall, Spring, Summer) (Evenings)*

ACCT 3121. Internal Auditing I. (3) Prerequisites: ACCT 2122 and consent of instructor. Introduction to internal auditing standards, ethics, audit evidence and techniques, and reporting practices and demonstration of these concepts through case studies. *(Spring)*

ACCT 3122. Internal Auditing II. (3) Prerequisites: ACCT 3121. Internal auditing management, quantitative techniques used by internal auditors, operational auditing, fraud and EDP auditing including demonstration of these techniques through the use of case studies and reports. *(Fall)*

ACCT 3130. Accounting for Not-for-Profit Organizations. (3) Prerequisite: ACCT 2121. Accounting for governmental and other not-for-profit entities. Three lecture hours, two lab hours. *(Fall, Summer)*

ACCT 3134. Federal Income Taxation. (3) Prerequisite: ACCT 2122. Open to non-Accounting majors only. Federal income tax laws and regulations applicable to individuals and business organizations. Three lecture hours, two lab hours. *(Fall) (Evenings)*

ACCT 3136. Managerial Cost Accounting. (3) Prerequisite: ACCT 2122. Prerequisite or corequisite: ACCT 3138. Analysis of the uses of accounting data in the planning, controlling and decision-making processes of business enterprises. Three lecture hours, two lab hours. *(Fall, Spring, Summer) (Evenings)*

ACCT 3138. Intermediate Financial Accounting I. (3) Prerequisite: ACCT 2122 with a grade of *C* or better. Analysis of the requirements of outsiders (investors, auditors and governments) for information about the status and operations of firms. The application of various theories and concepts will be stressed. Three lecture hours, two lab hours. *(Fall, Summer) (Evenings)*

ACCT 3139. Intermediate Financial Accounting II. (3) Prerequisite: ACCT 3138 with a grade of *C* or better. Continuation of ACCT 3138 with an emphasis on accounting problems peculiar to corporate organizations. Three lecture hours, two lab hours. *(Fall, Spring, Summer) (Evenings)*

ACCT 3140. Accounting Information Systems. (3) Prerequisites: STAT 1220, INFO 2130 and ACCT 3138. An introduction to accounting EDP systems, with particular emphasis on internal controls and computer auditing techniques. Three lecture hours, two lab hours. *(Fall, Spring) (Evenings)*

ACCT 3141. Specialized Accounting Topics. (3) Prerequisite: ACCT 3139 with a grade of *C* or better. Specialized accounting topics with emphasis on consolidated statements. Three lecture hours, two lab hours. *(Fall, Summer) (Evenings)*

ACCT 3146. Income Tax for Individuals. (3) Prerequisite: ACCT 2122 with a grade of *C* or better. Federal income tax laws and regulations applying to individuals. Three lecture hours, two lab hours. Lab is optional unless scheduled for an exam. *(Fall) (Evenings)*

ACCT 3147. Advanced Income Taxation. (3) Prerequisite: ACCT 3146. Federal income tax laws and regulations applying to partnerships, corporations, estates and trusts, and estate, gift and inheritance taxes. Three lecture hours, two lab hours. *(Spring) (Evenings)*

ACCT 3148. Internal Control and Auditing. (3) Prerequisite: ACCT 3139 (with a grade of *C* or better) and 3140. Analysis of the accounting control systems and the independent auditor's examination of the system and other evidence as a basis for expressing an opinion on financial statements. Three lecture hours, two lab hours. *(Fall, Spring) (Evenings)*

ACCT 3149. CPA Preparation. (3) Prerequisite: ACCT 3141. Intensive study of principles and techniques involved in the solution of advanced accounting problems encountered in public accounting practice. Three lecture hours, two lab hours. *(Spring)*

ACCT 3150. International Accounting. (3) Prerequisites: ACCT 2121 and 2122 and junior standing. A study of accounting techniques worldwide and how different techniques affect multi national firms and day to day international business practices. *(Fall, Spring, Summer)*

ACCT 3200 Foundations of Accounting. (3)-Accelerated and in-depth study of conceptual foundations and applications of financial, cost and managerial accounting with emphasis on building accounting information bases for internal, managerial decision-making. **(Accounting preparation to enter MBA**. May not be taken for credit toward any undergraduate degree within the Belk College of Business Administration or used as equivalent credit for ACCT 2121-2122). *(Fall, Spring)(Evenings)*

ACCT 3500. Cooperative Education Experience. (0) Prerequisite: Accounting major with department approval. Enrollment is required for the department's cooperative education students during each semester they are working in a co-op position. Course evaluation is Satisfactory/ Unsatisfactory grading. *(Fall, Spring, Summer)*

Graduate Only

ACCT 6110. Tax Research and Planning. (3G) Tax research techniques applicable to federal tax law affecting individuals, corporations and partnerships, including use of traditional and computerized tax services to solve tax problems. Emphasis on tax planning principles and related tax practice matters, including handling tax compliance issues and dealing with the Internal Revenue Service. *(Fall)*

ACCT 6120. Taxation of Corporations and Shareholders. (3G) Prerequisite: ACCT 6110. Tax law applicable to partnerships and S corporations, including tax compliance matters strategies for minimizing tax liabilities and strategies for handling tax controversies. *(Spring)*

ACCT 6130. Taxation of Partnerships and S Corporations. (3G) Prerequisite: ACCT 6110. Tax law applicable to partnerships and S corporations, including tax compliance matters strategies for minimizing tax liabilities and strategies for handling tax controversies. *(Spring)*

ACCT 6140. Taxation of Estates, Gifts, and Trusts. (3G) Prerequisite: ACCT 6110. Wealth transfer taxes and taxation of estates and trusts, including integration of these taxes and tax planning opportunities for minimizing tax liabilities. *(Summer)*

ACCT 6150. Business Tax Strategies. (3G) Prerequisite: consent of program coordinator. Tax strategies in all phases of business operations, including creation of the

business, choice of the type of business entity, financing, operations, distributions to owners, expansion, reorganization and liquidation with emphasis on minimizing taxes and avoid tax traps. Analysis of business planning cases and completion of a comprehensive project with the results presented in both an oral and written report. *(Spring) (Same as MBAD 6133)*

ACCT 6210. Advanced Accounting Information Systems. (3G) Documentation and evaluation of current accounting information systems, evaluation of potential new systems, to extract data from existing systems from analysis, and examination of emerging technologies which have potential uses in accounting information systems. *(Fall)*

ACCT 6220. Advanced Auditing. (3G) Audit practice, including the role of auditors in society, a study of legal liability issues, the theory of audit evidence, and analysis of internal control systems (including EDP), a review of audit regulations and ethics and the interpretation of audit reports. *(Fall)*

ACCT 6230. Controllership. (3G) Controllership practice, including organizational status, objectives, functions, duties and responsibilities and the managerial utilization of accounting and statistical data for planning and control. *(Same as MBAD 6134) (Yearly)*

ACCT 6250. Accounting Theory and Practice. (3G) Prerequisite: consent of program coordinator. Financial accounting theory and practice, including research techniques, analytical skills, communication skills, professional judgement, international and ethics issues. *(Spring)*

EDUCATIONAL ADMINISTRATION (ADMN)

Graduate Only

ADMN 6000. Topics in Educational Administration. (1-6G) May include classroom and/or clinic experiences in the content area. With department approval, may be repeated for credit for different topics. *(Fall, Spring, Summer)*

ADMN 6100. Fundamentals of Educational Leadership. (3G) The developing role of educational organizations in the United States and the societal and cultural influences that affect the delivery of schooling. Structure and organization of American schools, administrative and organizational theory, legal, moral, and ethical dimensions of schooling within the context of restructuring and reform. *(Fall)*

ADMN 6105. Legal Aspects of Schooling. (3G) Education law for education professionals which focuses on the legal rights and responsibilities of students, teachers, and administrators and how these legal provisions affect educational policy and practice. *(Fall, Spring)*

ADMN 6106. Legal Issues in Special Education. (3G) Survey of federal and state statutory and administrative provisions governing the delivery of education and related services to exceptional students. *(On demand)*

ADMN 6107. School Law for Counselors and Related Professionals. (3G) Legal issues and problems of special relevance to school counselors, psychologists, social workers, and related professionals who work with school-age children. *(On demand)*

ADMN 6110. School Leadership and Management. (3G) Examination of school leadership and administration, focusing on the role, tasks, and responsibilities that accompany school-based leadership. *(Summer)*

ADMN 6120. Instructional Leadership. (3G) Examination of research-based teaching/learning models and the relationship between instructional decisions and curriculum experiences. Dynamics of group development and problems/practices related to providing instructional assistance to teachers. *(Summer)*

ADMN 6121. Strategies and Designs in Curriculum Development. (3G) Examination of principles and practices for educational leaders in program design, implementation and evaluation. *(On demand)*

ADMN 6125. Advanced Instructional Techniques. (3G) Analysis of models of teaching and the match between attributes of the models and the instructional outcomes desired by the teacher. *(On demand)*

ADMN 6130. Supervision of Instruction. (3G) Corequisite: ADMN 6410. Introduction to clinical supervision and development of skills in classroom observation, analysis, evaluation, and assistance. Systems of observation, principles of adult development in school settings, techniques for conducting classroom observations and conferences, and development of staff development programs to remedy assessed weaknesses. *(Fall)*

ADMN 6140. Curriculum Leadership. (3G) Corequisite: ADMN 6420. Examination of internal and external influences on curriculum formation and development at the building level with emphasis on development of administrative strategies for curriculum decision-making which are driven by staff involvement. *(Spring)*

ADMN 6160. Introduction to Educational Administration. (3G) Examination of behavioral components of administrative theory, organization, decision-making and planning for educational development including appraisal of significant functions, techniques, practices and problems as they relate to public school systems, social institutions, and the system of social and governmental agencies. *(On demand)*

ADMN 6161. The Principalship. (3G) Examination of school administration focusing on the role, task and responsibilities associated with the principalship with special attention to the conceptual, human and technical skills associated with the principal. *(On demand)*

ADMN 6166. Educational Leadership. (3G) Examination of leadership in formal organizations and social and behavioral science research concerning leadership ability with emphasis on educational organizations and the role of the leader in the accomplishment of organizational goals. *(On demand)*

ADMN 6410. Internship and Seminar Part I. (3G, 9G) Corequisite: ADMN 6130. Full-time academic year internship in educational administration designed to allow

theoretical and course-based practical learning to be translated and interwoven into a supervised field-based experience. *(Fall)*

ADMN 6420. Internship and Seminar Part II. (3G, 9G) Corequisite: ADMN 6140. A continuation of the internship experiences and seminar begun in ADMN 6410. *(Spring)*

ADMN 6490. Internship and Seminar: Administration. (3-6G) Prerequisite: Department approval. Internship under the supervision of University and on-site personnel in a setting consistent with the student's professional goals in which the student will be involved in the diverse activities expected of the professional administrator. Seminars are held concurrently. *(On demand)*

ADMN 6491. Internship and Seminar: Supervision. (3-6G) Prerequisite: Permission of the department. Internship under the supervision of University and on-site personnel in a setting consistent with the student's professional goals in which the student will be involved in the diverse activities expected of the curriculum-instructional specialist. Seminars are held concurrently. *(On demand)*

ADMN 6601. Seminar in Administration and Supervision. (1-3G) Prerequisite: Permission of the department. Examination of selected areas of interest in educational administration and supervision. May be repeated for credit with departmental approval. *(On demand)*

ADMN 6800. Individual Study in Educational Administration. (1-6G) Prerequisite: Permission of the student's adviser. Independent study under the supervision of an appropriate faculty member. May be repeated for credit. *(Fall, Spring, Summer)*

Advanced Graduate Only

ADMN 7110. Organizational Theory and Behavior. (3G) Prerequisite: Admission to Ed.D. program in Educational Leadership. Analysis of the structure and organization of public education in the United States in terms of organizational theory and historical development. Consideration of organizational change theory, organizational development, and the planning process. *(Fall)*

ADMN 7120. Advanced School Law. (3G) Prerequisite: ADMN 6105 or 6107 or permission of the instructor. Current policy issues, including educational finance, testing/grouping, desegregation/integration, and the provision of public educational services to private-school students. *(Spring)*

ADMN 7130. Educational Governance and Policy Studies. (3G) Prerequisite: Admission to Ed.D. program in Educational Leadership. An examination of the institutional structure for policy-making in American education and the theories, models and practices that relate to policy-making in education. *(Summer)*

ADMN 7140. School Finance. (3G) Prerequisite: Admission to Ed.D. program in Educational Leadership or permission of instructor. An examination of the theory and operation of public school finance systems and school business administration with special attention to local, state, and federal sources of revenue and such business functions as budgeting and financing capital outlay projects. *(Fall)*

ADMN 7150. Human Resources Development and Administration. (3G) Prerequisite: ADMN 7110 or initial licensure as school administrator. Examination of personnel administration in educational institutions, including administration of personnel at the school district level and its contribution to the overall management and operation of a school system. *(Summer)*

ADMN 7190. Public School Administration. (3G) Examination of theory and practice of public school administration including the roles of school boards, superintendents, central office administrators and other members of the leadership team at the district-wide level with emphasis on the role of the superintendent. *(On demand)*

ADMN 7194. Planning School Facilities. (3G) Examination of practices, principles and procedures related to educational facility planning including an overview of the major steps involved in planning educational facilities and the roles of all participants in a building program with special emphasis on the roles of the superintendent and board of education. *(On demand)*

ADMN 7250. Educational Policy Studies: Trends, Issues, and Problems. (3G) Examination of educational issues, trends, problems, proposals, policies, and practices within historical, social, economic, political, and philosophical contexts. *(On demand)*

ADMN 7410. Advanced Internship in Educational Leadership Part I. (3G) Prerequisites: ADMN 7110, 7120, 7130, and 7140. Internship experiences planned and guided cooperatively by University and school personnel, including some work in private, community, or social service organizations. Accompanying cohort seminar for integrating and synthesizing knowledge and skills useful to practicing school leaders. *(Fall)*

ADMN 7420. Advanced Internship in Educational Leadership Part II. (3G) Prerequisite: ADMN 7410. Continuation of ADMN 7410. *(Spring)*

ADMN 7489. Practicum in Staff Development. (3G) Examination of techniques of delivering in-service training and development of leadership for in-service educational programs including design and implementation of a staff development program in a school setting. *(On demand)*

ADMN 7490. Culminating Experience: Administration. (3-6G) Demonstration of appropriate leadership abilities in a field setting. Required for school administrators. May be repeated for credit. *(On demand)*

ADMN 7491. Culminating Experience: Supervision. (3-6G) Demonstration of appropriate leadership skills in a field setting. Required for curriculum and instruction specialists. May be repeated for credit. *(On demand)*

ADMN 7601. Seminar in Administration and Supervision. (1-3G) Prerequisite: Permission of the department. Examination of selected areas of educational administration and supervision. May be repeated for credit with departmental approval. *(On demand)*

ADMN 7610. Interdisciplinary Seminar. (1G) Prerequisite: Admission to Ed.D. program in Educational Leadership. Corequisite: Simultaneous enrollment in one or more courses in the Ed.D. program. Ideas, values, cultures, and contemporary issues affecting society generally and education particularly and principles and practices for responding to the publics with whom school leaders interact. May be repeated for credit. *(Fall, Spring)*

ADMN 7660. Instructional Leadership Seminar. (3G) Prerequisite: EDUC 7122. Investigation and evaluation of current trends and issues in supervision as they relate to the role of the educational leader, with special attention to the role of facilitating the teaching/learning process. *(Summer)*

ADMN 7695. Advanced Seminar in Teaching and Learning. (3G) Examination of a number of current teaching models to provide a framework for choosing those appropriate for a given classroom setting with special attention to the relationship between teaching strategies and learning outcomes. *(On demand)*

ADMN 7800. Individual Study in Educational Administration. (1-6G) Prerequisite: Permission of the student's adviser. Independent study under the supervision of an appropriate faculty member. May be repeated for credit. *(Fall, Spring, Summer)*

ADMN 7999. Graduate Residence. (0G) Meets Graduate School requirement for continuous enrollment during completion of a capstone project or comprehensive examination. *(Fall, Spring)*

ADMN 8699. Dissertation Proposal Seminar. (3G) Prerequisite: Completion of research requirements. Identification and definition of a research area and development of a proposal draft for an original research study appropriate for the dissertation requirement. *(Fall)*

ADMN 8999. Dissertation Research. (3G) Prerequisite: Consent of Ed.D. program coordinator. Execution of original research study that addresses the solution to an educational or school-related problem or that addresses a substantive educational leadership or programmatic issue. *(Fall, Spring, Summer)*

AEROSPACE STUDIES (AERO)

Undergraduate

AERO 1101. The Air Force Today. (1) Preprofessional corequisite: AERO 1101L. Survey of topics relating to the Air Force and defense which focuses on organizational structure and missions of Air Force organizations; officership and professionalism; and basic communicative skills. *(Fall)*

AERO 1101L. The Air Force Today. (0) Leadership Lab. *(Fall)*

AERO 1102. The Air Force Today. (1) Preprofessional corequisite: AERO 1102L. A continuation of AERO 1101 to include a study of geographical awareness and geopolitics, U.S. defense policy and strategy, dynamics of international terrorism, and relation of other armed service components to the Air Force mission. *(Spring)*

AERO 1102L. The Air Force Today. (0) Leadership Lab. *(Spring)*

AERO 2101. Development of Air Power I. (1) Pre-professional corequisite: AERO 2101L. Examination of the development of air power from its beginnings through two world wars; the evolution of air power concepts and doctrine; and an assessment of communicative skills. *(Fall)*

AERO 2101L. Development of Air Power I. (0) Leadership Lab. *(Fall)*

AERO 2102. Development of Air Power II. (1) Pre-professional corequisite: AERO 2102L. A continuation of AERO 2101 which examines the history of airpower from the Korean War to the present. *(Spring)*

AERO 2102L. Development of Air Power II. (0) Leadership Lab. *(Spring)*

AERO 3101. Defense Administration and Military Management. (W) (3) Pre-professional corequisite: AERO 3101L. Examination of Air Force doctrine and management with emphasis on total quality management (TQM) and its value in the military environment. Emphasis on written and oral communication. *(Fall) (Alternate years)*

AERO 3101L. Defense Administration and Military Management. (0) Leadership Lab. *(Fall) (Alternate years)*

AERO 3102. Leadership and Management. (3) Pre-professional corequisite: AERO 3102L. Study of leadership theory and skills and the Air Force officer's role as a leader. Emphasis on written and oral communication. *(Spring) (Alternate years)*

AERO 3102L. Leadership and Management. (0) Leadership Lab. *(Spring) (Alternate years)*

AERO 3201. National Security Issues in Contemporary American Society. (3) Pre-professional corequisite: AERO 3201L. The executive-legislative matrix of our national government is developed and compared with other governmental systems. Conflict management methods are examined including arms control, alliances and regional security issues. *(Fall) (Alternate years)*

AERO 3201L. National Security Issues in Contemporary American Society. (0) Leadership Lab. *(Fall) (Alternate years)*

AERO 3202. The Defense Leader: Perspectives on Ethics and Justice. (V) (3) Pre-professional corequisite: AERO 3202L. Continued development of the fundamentals presented in AERO 3201 with special emphasis on the role of the emerging military leader in implementing national policy decisions. Discussion of selected ethical and military justice scenarios are presented to prepare the student with an adequate intellectual framework for action. *(Spring) (Alternate years)*

AERO 3202L. The Defense Leader: Perspectives on Ethics and Justice. (0) Leadership Lab. *(Spring)*

AMERICAN STUDIES (AMST)

Undergraduate

AMST 3000. Topics in American Studies. (3) Introduction to the interdisciplinary approach, demonstrating how traditionally distinct disciplines, such as literature and history, or art and political science, interrelate and contribute to an understanding of an American topic. May be repeated for credit with permission of the student's adviser. (*Yearly*)

AMST 3100. Introduction to American Studies. (L or C) (3) Introduction to American culture through an in-depth study of a single decade or era, such as the 1830s, 1890s, 1920s, 1950s or 1960s. Focus on how diverse social, economic, artistic, literary, philosophical and political forces have shaped American society. Students examine the complex and multifaceted nature of American culture, both as it pertains to the specific era under study and to the present day. (*Fall, Spring*)

AMST 3210. Childhood in America. (C) (3) Exploration of the changing nature of childhood in American society. Examines how social and economic developments have affected the child's position in the family, the workplace and the school. Child-rearing philosophies and techniques from the colonial period to the present and the history of children's literature, toys and entertainment will be studied. (*Fall) (Alternate years*)

AMST 3800. Independent Study or Directed Reading in American Studies. (3) May be repeated once for credit, with permission of the student's adviser. (Not limited to American Studies students but should be under the supervision of an American Studies adviser or designate.) (*On demand*)

ANTHROPOLOGY (ANTH)

Undergraduate

ANTH 1101. Introduction to Anthropology. (VX) (3) Biological and cultural evolution; archeology; language and culture; comparative study of human social institutions such as kinship, subsistence patterns, religion, politics; methods and theories. Prerequisite for all upper-level courses in anthropology. (*Fall, Spring, Summer) (Evenings*)

ANTH 2010. Topics in Ethnography. (3) Investigation of ethnographic regions of the world. May be repeated for credit as the topics vary. Examples: Plains Indians, Peoples of The Mediterranean. (*On demand*)

ANTH 2050. Topics in Archeology. (3) Specialized topics in archeology. May be repeated for credit as topics vary. Examples: Historic Archeology, Old World Prehistory. (*On demand*)

ANTH 2090. Topics in Anthropology. (1-3) Specialized topics in anthropology. May be repeated for credit as topics vary. Examples: Hunters and Gatherers, Political Anthropology (*On demand*)

ANTH 2111. Peoples of Africa. (3) Ethnic and linguistic diversity in Sub-Saharan Africa; ecology and culture; patterns of continuity and change in kinship, marriage, economy, social control, stratification, and religion. (*Yearly*)

ANTH 2112. North American Indians. (3) Survey of the native peoples of America; culture at the time of European contact; major historical events and relationships; contemporary issues in Indian affairs. (*Yearly*)

ANTH 2114. Indians of the Southeastern United States. (X) (3) Study of American Indians of the Southeastern United States with emphasis on tribes of the Carolinas. Areas of investigation include pre-contact cultures, Indian-European contact relationships, history, and contemporary Southeastern Indian issues. (*Alternate years*)

ANTH 2115. Culture and Society in the Middle East. (3) Patterns of subsistence, social and political organization in North Africa and the Middle East. Changes in family and community structures, migration, gender roles and religious outlook since the colonial period. *(Spring) (Alternate years)*

ANTH 2121. Comparative Family Systems. (WX) (3) Cross-cultural survey of the origins and forms of the human family and interrelationships with other cultural institutions; role of the family in kinship, marriage, childrearing, sex roles, economics, political organization, and religion. (*Alternate years)*)

ANTH 2122. Beliefs, Symbols and Rituals. (3) Structure and content of systems of belief and ritual; role in social life; analysis of religion, myth, magic, witchcraft, symbol systems, cult movements and religious change. (*Yearly*)

ANTH 2124. Language and Culture. (3) Examination of language as part of culture; relationship between language and other cultural features; historical linguistics, phonetics and phonemics, componential analysis, dialects, kinesics and body language, situational analysis of language. (*On demand*)

ANTH 2125. Urban Anthropology. (3) Cross-cultural analysis of urban life; rise of early cities; rural-urban differences; migration; ethnicity, urban poverty; effects of urban life on kinship systems; modernization. (*On demand*)

ANTH 2141. Principles of Physical Anthropology. (S) (4) Evolutionary theory; primates; primate and human evolution; population genetics; human variation, disease, nutrition; osteology. Three lecture hours and two lab hours each week. (*Fall, Spring*)

ANTH 2142. Primate Behavior. (3) Primate evolution, taxonomy, social behavior, ecology, reproductive strategies; monkeys, apes and human beings; communication, aggression, mother-infant bonding, sociobiology; fieldwork, conservation. (*Yearly*)

ANTH 2151. General Archeology. (3) Archeological method and theory; trends in human cultural development; important archaeological sites and cultures from Old and New Worlds. (*Fall*)

ANTH 2152. New World Archeology. (3) Prehistory of North America; Paleoindians, Eastern United States, Southwest, Mexico; archeological methods and theory. (*Spring*)

ANTH 3101. Foundations of Anthropological Theory. (3) Prerequisites: ANTH 1101 and junior standing. History of

anthropological theory; the anthropological perspective in the social sciences; examinations of current theoretical and methodological issues in anthropology. (*Fall*)

ANTH 3111. Culture Change and Applied Anthropology. (3) Prerequisite: ANTH 1101 or consent of instructor. Cultural dynamics; agents and conditions promoting growth; methods of applied anthropology in health care, education, and such areas as development. (*On demand*)

ANTH 3112. Anthropology and Art. (X or A) (3) Prerequisite: ANTH 1101 or consent of instructor. Cross-cultural investigation of various forms of artistic expression throughout the world and how they function in terms of values and cultural context. Includes hands-on experiences in different art forms. (*Yearly*)

ANTH 3122. Culture, Health and Disease. (3) Prerequisite: ANTH 1101 or consent of the Department. Relationship between cultural beliefs and practices and patterns of health and illness in human populations; role of disease in human evolution, ecology and epidemiology, nutrition, cultural systems of healing, roles of patient and healer, culture and emotional states, role of religion, and magic in healing. (*On demand*)

ANTH 3132. Aging and Culture. (WX) (3) Examination of the processes of aging in various cultural contexts, with emphasis on the implications for understanding aging within American society. Application of anthropological theories and methods to the study of aging. *(Yearly)*

ANTH 3140. Forensic Anthropology. (3) Comparative human anatomy and physical anthropology applied to modern problems in the identification of human remains. Surveys anthropological methods used to recover, recognize, interpret and identify human remains in paleontology, archaeology, criminal and mass disaster investigations; includes field exercise in crime scene recovery, and visits to relevant county and city agencies. (*Yearly*)

ANTH 3152. Early Civilizations. (3) Prerequisite: ANTH 1101 or 2151 or consent of instructor. Great civilizations of Old and New Worlds; Mesopotamia, India, Greece, Africa, Egypt, China, Mexico, Peru; theories of cultural evolution; beginnings of complex societies; archeological theory and method, environment and ecology of first civilizations. (*Alternate years*)

ANTH 3153. Archeological Analysis. (3) Prerequisite: ANTH 2151 or consent of the instructor. Advanced study of archeological method and theory; analytical methods; statistics in archeology. (*Alternate years*)

ANTH 3154. European Prehistory. (3) Prerequisite: ANTH 1101 or 2151 or consent of the instructor. Prehistory of Europe; Paleolithic, Neolithic, Bronze Age, Iron Age; archeological methods and theory; ecology and social systems of early European cultures. (*Alternate years*)

ANTH 3453. Field Projects in Archeology. (1-4) Prerequisite: ANTH 1101 or 2151 or consent of the instructor. (Credit hours will be established by instructor prior to the field project.) Practical experience in archeological techniques. Students will participate in field research on an historic or prehistoric archeological site. Research may include field reconnaissance, excavation, mapping, systematic description and analysis of cultural material, and/or other techniques appropriate to the site and research problem. May be repeated for credit as projects vary. Up to eight hours of credit may be applied toward the anthropology major. (*Summer*)

ANTH 3480. Internship in Anthropology. (3-4) Prerequisite: consent of the department. Research and/or in-service training experience in a cooperating community organization. Contents of internship based upon a contractual agreement among the student, Department, and community organization. Amount of credit determined by the nature and extent of the internship assignment. May be repeated for credit up to a maximum of six semester hours. Offered only on a Pass/No Credit basis. **(***Fall, Spring, Summer***)**

ANTH 3601. Seminar in General Anthropology. (W) (3) Prerequisite: ANTH 3101 and senior standing. Synthesis and integration of subfields of anthropology with emphasis on individual research projects. **(***Spring***)**

ANTH 3895. Directed Individual Study. (1-4) Prerequisite: ANTH 1101 and consent of the department. Supervised investigation of problems and areas in anthropology. May be repeated for credit. **(***Fall, Spring, Summer***)**

Undergraduate/ Available for Graduate Credit

Additional work required for graduate credit.

ANTH 4090. Topics in Anthropology. (1-3) (1-3G) Prerequisite: ANTH 1101 or consent of instructor. Examination of specialized topics in anthropology. May be repeated for credit as topics vary. Examples: Human Ecological Systems, Women and Culture, Primitive Arts and Crafts. (*On demand*)

ANTH 4110. American Ethnic Cultures. (X) (3) (3G) Prerequisite: ANTH 1101 or consent of instructor. An anthropological and ethnohistorical survey of ethnicity, persistence and cultures of the ethnic groups of America. Topics include theories of ethnicity, immigration, ethnic identity, reasons for immigration, acculturation experiences, and cultural characteristics of established and more recent ethnic groups. (*On demand*)

ANTH 4120. Intercultural Communications. (3) (3G) Prerequisite: ANTH 1101 or consent of instructor. Learning to cope with cultural differences; contrasting value systems; cross-cultural and communication styles; nonverbal communication; cultural relativity; culture and perception; ethnocentricism; cultural shock. (*Yearly*)

ANTH 4121. Culture and Personality. (3) (3G) Prerequisite: ANTH 1101 or PSYC 1101 or consent of instructor. Anthropological contributions to theories of personality formation; data on tribal and national characteristics, patterns of childrearing, culturally derived aspects of human behavior, deviance and personal integration with the cultural milieu. (*Alternate years*)

ANTH 4140. Primatological Field Observation. (4)(4G) Prerequisite: consent of instructor. Practical experience in techniques of observation of animal behavior with a focus on the primates. Training in methods of hypothesis formulation, observation, record-keeping and data analysis. Research on captive and free ranging animals. Analysis of the behavioral characteristics of prosimians, monkeys, and apes. (*Summer*)

ANTH 5090. Topics in Anthropology. (3)(3G) Prerequisite: consent of the instructor. Intensive treatment of a topic in anthropology or survey of related topics, depending on student needs and interest. May be repeated for credit as topics vary. *(On demand)*

Graduate Only
ANTH 6112. American Indian Studies Through Curriculum Development. (3G) Cultural descriptions of American Indians by culture area; contact relationships and policies; issues in contemporary Indian affairs presented through lectures, audio-visual materials, workshop activities and field trips. Emphasis on development of curriculum materials for elementary school teachers. *(Summer)*

ANTH 6132. Culture, Health and Aging. (3G) Exploration of the interaction between culture and the aging experience, with a particular emphasis on issues of health and the health care system. *(On demand)*

ARCHITECTURE (ARCH)

Studio & Seminar Courses
Undergraduate
ARCH 1100. History of American Architecture. (A)(3) Prerequisite: No major in Architecture. American architecture from ca.1600 to the present with a focus on the cultural and environmental forces shaping American architecture. *(Fall)*

ARCH 1105. Comprehensive Studio. (5) 11 contact hours. Prerequisite: major in Architecture. Corequisite: ARCH 1601. Laboratory/studios dealing with visual ordering systems, environmental design issues and creative problem identification/solving process, as well as development of visual and verbal communication skills. (*Fall*)

ARCH 1106. Comprehensive Studio. (5) 11 contact hours. Prerequisites: ARCH 1105 and 1601. Corequisite: ARCH 1602. Laboratory/studios concentrating on development of the vocabulary of form. Drawing, modeling, experimenting, and experiencing the conceptual development of shape, color, surface, space, volume, and the programmatic reasoning that is manifest in each. Advanced visual communication skills are emphasized. (*Spring*)

ARCH 1601. Architectural Seminar. (2) Corequisite: ARCH 1105. This course represents the first half of a series of lectures alternating between topics of architectural craft and architectural ideology. Conceptions of form, space and order, principles of spatial definition, and methods of representation are presented along with a range of theoretical positions concerning how architecture incorporates ideas. (*Fall*)

ARCH 1602. Architectural Seminar. (2) Corequisite: ARCH 1106. Prerequisites: ARCH 1105 and 1601. This course continues the format of ARCH 1601 and the lectures concerning architectural craft centering on topics of building elements, spatial sequence, scale and proportion, color and light, and the implications and potency of construction materials. (*Spring*)

ARCH 2105. Comprehensive Studio. (5) 11 contact hours. Prerequisites: ARCH 1106 and 1602. Corequisite: ARCH 2601. Laboratory/studios emphasizing the significant purposes for building; understanding the theoretical, technical and symbolic consideration of the environment relative to intervention, and intentions from behavioral information toward a comprehensive design process. (*Fall*)

ARCH 2106. Comprehensive Studio. (5) 11 contact hours. Prerequisites: ARCH 2105 and 2601. Corequisite: ARCH 2602. Laboratory/studios concentrating on the development, experimentation and understanding of the range, potential, materials, systems, and methods in the use of architectural technologies. (*Spring*)

ARCH 2601. Architectural Seminar. (W) (2) Prerequisites: ARCH 1602 and 1106. Corequisite: ARCH 2105. This seminar introduces models of design process to build judgmental capacity in the areas of function, spatial organization, culture, and landscape. Site planning is presented both as a technical demand and a formal device. Lectures, demonstrations and design workshops are used to build skill. (*Fall*)

ARCH 2602. Architectural Seminar. (W) (2) Prerequisites: ARCH 2601 and 2105. Corequisite: ARCH 2106. This seminar introduces both theoretical and practical background information in the areas of form, material and use. Each area is explored through readings, lectures, design workshops and field trips. (*Spring*)

ARCH 3101. Architectural Studio. (5) 9 contact hours. Prerequisites: ARCH 2106 and 2602. Third year design studios continue the investigations about the thoughtful making of buildings, within an increasingly holistic pedagogical framework, and with special regard to the utility of buildings and the human rituals of their occupation. (*Fall*)

ARCH 3102. Architectural Studio. (5) 9 contact hours. Prerequisite: ARCH 3101. Continuation of ARCH 3101. (*Spring*)

Undergraduate/Available for Graduate Credit
ARCH 4050. Architecture Elective. (3) (3G) Concentrated, in-depth study of selected topic. *(Fall, Spring, Summer)*

ARCH 4101. Architectural Studio. (5) (5G) 9 contact hours. Prerequisite: ARCH 3102. Series of studio sections offered with different emphasis and subject concentration to allow students to obtain a variety of studio experiences and pursue an area of study. (*Fall*)

ARCH 4102. Architectural Studio. (5) (5G) 9 contact hours. Prerequisite: ARCH 4101. (*Spring*)

ARCH 5050. Architecture Elective. (3) (3G) Concentrated, in depth study of selected topic. *(Fall, Spring, Summer)*

Graduate Only
ARCH 6050. Architecture Elective. (3G) Concentrated, in depth study of selected topic. *(Fall, Spring, Summer)*

Architectural History/Theory Courses
Undergraduate
ARCH 2111. Ancient Architecture. (A) (3) Prerequisite: Non-majors: ARCH 1100 or consent of instructor. Study of ancient architecture and communities with emphasis upon the built environment as a cultural, political, religious, economical and visual expression. *(Fall)*

ARCH 2112. Medieval/Renaissance Architecture. (A) (3) Prerequisite: Non-majors: ARCH 1100 or consent of instructor; Majors: ARCH 2111. Medieval and renaissance architecture and communities; emphasis on the built environment as a cultural, economical, political, religious and visual expression. *(Spring)*

ARCH 3111. History and Theory of Architecture. (A) (3) Prerequisite: Non-majors: ARCH 1100 or consent of instructor; Majors: ARCH 2112. Study of theoretical, technical, and cultural background of architecture and urban design from c1750 to c1900. *(Fall)*

ARCH 3112. History and Theory of Architecture. (3) Prerequisite: Non-majors: ARCH 1100 or consent of instructor; Majors: ARCH 3111. Study of theoretical, technical, and cultural background of architecture and urban design from c1900 to the present. *(Spring)*

Undergraduate/Available for Graduate Credit
ARCH 4211. Architectural History I. (3) (3G) Study of the theoretical, technical, and cultural background of architecture and urban design from prehistory to 1750. *(Fall)*

ARCH 4212. Architectural History 2. (3) (3G) Study of the theoretical, technical, and cultural background of architecture and urban design from 1750 to present. *(Spring)*

ARCH 4213. Topics in the History/Theory of Archietcture I. (3) (3G) Prerequisite: ARCH 4212, or permission of instructor. *(Fall)*

ARCH 4214. Topics in the History/Theory of Architecture II. (3) (3G) Prerequisite: ARCH 4212, or permission of instructor. *(Spring)*

Graduate Only
ARCH 6131. Readings in History/Theory 1. (1G) Co-requisite: ARCH 4211. Seminar on readings from theory of the period being covered in accompanying survey course. *(Fall)*

ARCH 6132. Readings in History/Theory 2. (1G) Co-requisite: ARCH 4112. Seminar on readings from theory of the period being covered in accompanying survey course. *(Spring)*

ARCH 6133. History/Theory Elective. (3G) Elective seminar in architectural history/theory. *(Fall)*

ARCH 6134. History/Theory Elective. (3G) Elective seminar in architectural history/theory. *(Spring)*

ARCH 6135. Architectural Theory. (3G) History of ideas and intellectual thought in architectural discourse. *(Fall)*

Building Systems Courses
Undergraduate
ARCH 3141. Building Systems One. (3) Prerequisites: MATH 1103 and PHYS 1101. Basic quantitative study of structural and material behavior, as well as continued study of qualitative behavior initiated in the Foundation Program studios. *(Fall)*

ARCH 3142. Building Systems Two. (3) Prerequisite: ARCH 3141. Continuation of ARCH 3141. *(Spring)*

ARCH 3143. Building Systems Three. (3) Prerequisite: ARCH 3142. Continuation of ARCH 3142. *(Fall)*

ARCH 3144. Building Systems Four. (3) Prerequisite: ARCH 3143. Continuation of ARCH 3143 and foundations, lateral structural systems, high-rise, long-span structures, and lateral stability resistance. *(Spring)*

Graduate Only
ARCH 6141. Environmental Control Systems. (3G) Principles that influence thermal, luminous, and acoustical environments explored as influences in the production of architecture. *(Fall)*

ARCH 6142. Structures I. (3G) Types and sources of loads on buildings; of Rigid Body and Deformed Body Mechanics as a methodology to analyze statically determine structures; Allowable Stress Method as a technique for the design of structural members, such as beams, columns, trusses, and connections. *(Spring)*

ARCH 6143. Structures 2. (3G) Prerequisitc: ARCH 6142. Design of beams, columns, trusses and connection made of wood, steel, and reinforced concrete; load factor design methodology in the structural design process; connections of structural members. *(Fall)*

ARCH 6144. Structures 3. (3G) Prerequisite: ARCH 6143. Analysis of soils as a structural material and the implication of this information on building foundations; dynamics and lateral loads on buildings and the methods used to resist these forces; high rise and long-span buildings; basic mechanical systems in buildings. *(Spring)*

ARCH 6145. Construction/Material Systems. (3G) Case study seminar on constructional and material systems in various building types. *Fall)*

General Architectural Courses
Undergraduate
ARCH 3050. Architectural Elective Studios. (3) Contact hours to depend upon the nature of the course. Prerequisite: ARCH 2102. Lecture/seminar/laboratory courses which include concentrated, in-depth study of selected environmental design/planning subjects. Specific subjects to be announced by time of academic registration. *(Fall, Spring)*

ARCH 3160. Design Process. (3) Prerequisite: ARCH 2101 or consent of instructor. Design skills required by

architects and other professionals in utilizing varying models of design, design judgment/evaluation, design synthesis and inquiry through design. Sources and uses of design information which may lead to a better fit between psychological demand and the built form. *(Fall)*

ARCH 3162. Passive Environmental Control Systems. (3) Prerequisite: ARCH 2101 or consent of the instructor. Design procedures for passive environmental technologies and their interrelationship with the building design process. *(Fall)*

ARCH 3163. Concepts of Architectural Acoustics. (3) Prerequisite: ARCH 2102 or consent of the instructor. Study of sound behavior, relationships between sound and building form, materials and structures, and spatial use including principles of sound and hearing, analysis of sound absorption and transmission. ASTM standard test methods, acoustical privacy in open plans, design for good hearing in rooms, and mechanical system noise and vibration control. *(Fall)*

ARCH 3164. Computer Applications in Architecture. (3) Prerequisite: ARCH 2102 or consent of the instructor. Introduction to computers and their impact on the architectural profession. Emphasis on graphics application programs (pre-packaged) and their use in visualizing architecture. Introduction to BASIC programming language. *(Fall, Spring)*

ARCH 3890. Directed Independent Study. (1-3) Prerequisite: major in Architecture. This course is designed to allow students to pursue faculty-directed independent study topics not provided by other College offerings. May be repeated for credit with the approval of the College. May not be taken in conjunction with ARCH 4103 and ARCH 4104 without permission from Chair of Instruction. *(Fall, Spring)*

Undergraduate/Available for Graduate Credit
ARCH 4103. Architectural Studio. (5) (5G) 9 contact hours. Prerequisites: major in Architecture, ARCH 4102. *(Fall)*

ARCH 4104. Thesis Studio. (7) (7G) 15 contact hours. Prerequisites: ARCH 4103, 4111 with grades of *C* or better. Corequisite: ARCH 4112. Execution of thesis project proposed by the student and accepted by the faculty for ARCH 4111. *(Spring)*

ARCH 4111. Thesis/Project Proposal. (4) (4G) A proposal to initiate a thesis or terminal project, approval of which is required for admission to ARCH 4104. Work will be undertaken in close collaboration with a thesis adviser. *(Fall)*

ARCH 4112. Architectural Practice. (2) (2G) Corequisite: ARCH 4104. Learning objectives include an understanding of the practice of architecture today, its responsibilities and procedures, and emerging alternative forms of practice and roles of the architect. *(Spring)*

ARCH 5112. Professional Practice. (3) (3G) Presentation and case study seminar examining the practice of architecture today, its responsibilities, and procedures, and emerging alternative forms of practice. *(Spring)*

ARCH 5611. Theory of Design Seminar I. (3) (3G) Prerequisite: ARCH 6101. Study of architectural theory from Vitruvius to the present. Special emphasis will be placed on reading primary sources. *(Fall)*

ARCH 5612. Theory of Design Seminar II. (3) (3G) Prerequisite: ARCH 6102. Continuation of ARCH 5611. Intensive investigation of specific theoretical positions. *(Spring)*

ARCH 5641. Theory of Technology Seminar I. (3) (3G) Prerequisite: ARCH 6101. Survey of the uses and understandings of machines and images of machines since the beginning of the industrial revolution. *(Fall)*

ARCH 5642. Theory of Technology Seminar II. (3) (3G) Prerequisite: successful completion of ARCH 6102. Continuation of ARCH 5641. Intensive investigation of specific theoretical positions. *(Spring)*

Graduate Only
ARCH 6101. Studio/Research. (7G) Introduction to the methods of architectural research and to the theme topic for the year. Course worksite chosen to offer the greatest possibilities to study architectural examples relevant to the theme. *(Summer)*

ARCH 6102. Design/Research Studio. (5G) Prerequisite: ARCH 6101. A coordinated set of representative research efforts and intensive individual research projects on the theme. Course content determined by theme for the year. *(Fall)*

ARCH 6103. Design/Research Studio. (5G) Prerequisite: ARCH 6102. Focus on individual topics of research and design that are related to the general theme. *(Spring)*

ARCH 6104. Design Studio. (7G) Prerequisite: ARCH 6103. An intensive design charrette which represents the culmination of the topical studies and research projects completed by the students and professors on the selected theme for the first year. *(Summer)*

ARCH 6121. Architecture and Cultural Context I. (4G) Prerequisite: ARCH 6101. Examination of paradigms of human activity, such as the means and methods of production and its influence on the products of culture; structuralism as a method of understanding philosophical and cultural phenomenon; literary and artistic criticism as a way of understanding cultural objects; and modernism and the history of technology as dual expressions of the industrial revolution. *(Fall)*

ARCH 6122. Architecture and Cultural Context II. (4G) Prerequisite: ARCH 6102. Continuation of ARCH 6121. *(Spring)*

ARCH 6151. Design Methodology. (3G) Examination of analytic and synthetic models including information processing, programming, and implementation activities used to structure the architect's design process; conjectural models and methods specific to the architect's creative skills. *(Fall)*

ARCH 6811. Directed Independent Study (3G) Prerequisite: permission of graduate faculty member

directing the study and the MSA coordinator. Directed individual study and in-depth analysis of a special area related to the annual theme of the program. May be repeated once. *(Fall, Spring, Summer)*

ARCH 7110. Summer Study Program. (6G) Students choose from three summer study options: 1) participation in one of the College's Off Campus Study Programs; 2) participation in a Summer Coop experience (students will be placed with firms by the Graduate Adviser); and 3) pursuit of a directed research effort supervised by a COA Faculty member. *(Summer)*

ARCH 7111. Research Document. (3G) Documentation of research concepts, procedures, methods, and anticipated thesis findings. *(Fall)*

Architectural Design Studios
Graduate Only
ARCH 6111. Design Fundamentals/Skills. (7G) Introductory analytic architectural studio which focuses on the acquisition and practice of a variety of technical and graphic skills. *(Fall)*

ARCH 6112. Design Fundamentals/Skills. (6G) Prerequisite: ARCH 6111. Introductory architectural studio which focuses on the acquisition and practice of a variety of technical and graphic skills and the development of synthetic design skills. *(Spring)*

ARCH 7101. Comprehensive Building Design Emphasis Studio. (5G) Prerequisite: ARCH 6112. Design studio focusing on site specific projects emphasizing technological issues which lead toward comprehensive building designs. *(Fall)*

ARCH 7102. Urban Emphasis/Topical Studio. (5G) Prerequisite: ARCH 7101. Design studio focusing on site specific projects with emphasis on urban, spatial, and behavioral issues. *(Spring)*

ARCH 7103. Topical Studio. (5G) Prerequisite: ARCH 7102. Architectural studio with topical emphasis and subject concentration to allow students to pursue an area of study. *(Fall)*

ARCH 7104. Thesis Studio. (8G) Prerequisite: ARCH 7103. Individualized design/research projects advised by the faculty. *(Spring)*

ARTS AND SCIENCES (ARSC)

Undergraduate
ARSC 1000. Freshman Seminar. (3) Designed to assist with the intellectual and social transition from high school to college by developing positive attitudes toward learning and increasing the involvement of students in the intellectual life of the campus; providing an orientation to resources available to students; and promoting problem solving and writing skills. Each section will be developed around a content theme, usually selected from the instructor's discipline. *(Fall, Spring)*

ARSC 3000. Topics in Arts and Sciences. (3) Prerequisites: junior standing and consent of the sponsoring departments. Topics chosen from the general area of the arts and sciences in order to demonstrate relationships and interdisciplinary influences. May be repeated for credit as topics vary with consent of the student's major department. Can be used toward general degree requirements as indicated each time the course is offered. *(On demand)*

ARSC 3400. Non-Residential Studies. (1-15) Experience outside the University which provides an alternative learning opportunity to broaden understanding of the major and provide an introduction to various careers. All arrangements for non-residential study must be approved in advance and include a written proposal of goals, methods, duration, hours credit, and evaluation procedures. The University Career Center is available to assist students to locate appropriate work experiences. Student projects will be approved, supervised, and evaluated within the student's major department. Grading by a faculty adviser may be on a *Pass/No credit* basis, ordinarily to be taken in the Junior or Senior year. No more than 15 hours of Non-Residential Studies may be presented toward a degree. (Cannot be used toward general degree requirements.) Contact major department or University Career Center for information. *(On demand)*

ARSC 3500. Cooperative Education Experience. (0) Prerequisites: departmental GPA and credit hours required and approval by the Co-op Coordinator. Enrollment in this course is required for Arts and Sciences students involved in professional work experiences offered through either the parallel (part-time work) or the alternating (full-time work) option of the cooperative education program. Students on co-op assignments pay a special fee and receive full-time student status. Assignments must be arranged and approved in advance. For information, contact the University Career Center. *(Fall, Spring, Summer)*

ART
Course offerings are listed by number within area of study.

Academic and Departmental Art

ARTA 1111. Art Appreciation. (A) (3) Introduction to the appreciation of art through slide lectures concerning a brief chronological history of art, the elements of design, and general concepts of art. For non-majors only. *(Fall, Spring, Summer)*

ARTA 1211. Art History Survey I. (A) (3). Survey of Western and Near Eastern Art from prehistoric times to 1400 A. D. with special emphasis upon the interrelationship of the visual arts and other cultural developments. Discussions of readings, lectures, slides and video tapes. Essay exams. *(Fall)*

ARTA 1212. Art History Survey II. (A) (3). Survey of Renaissance, Baroque and Modern Art from A. D. 1400 to the present, with special emphasis upon the interrelationship of the visual arts and other cultural developments. Discussions of readings, lectures, slides and video tapes. Essay exams. *(Spring).*

ARTA 2112. Asian Art. (A or X) (3) Survey of Indic, Chinese, and Japanese art with special emphasis upon the art as the illustration of religious, philosophical, and

political ideals. Discussions of readings, lectures, slides, and video tapes. Essay exams. *(Fall)*

ARTA 2113. Native Art. (A or X) (3) Survey of Pre-Columbian and Native American art, Africa, and Oceania with special emphasis upon the art as the illustration of religious, philosophical, and political ideals. Discussion of readings, lectures, slides, and video tapes. Essay exams. *(Spring)*

ARTA 2212. Art History Methods. (3) Prerequisite: ARTA 1211 and 1212, or consent of instructor. Survey of primary methodologies, theories and research in the history of art and art criticism, including formalism; iconography; connoisseurship; biography; social history; Marxism; feminism; postmodern and contemporary theory. *(Fall)*

ARTA 2219. History of Photography. (3) Survey of the major events and stylistic developments in photography from 1839 to the present. *(Spring) (Alternate years)*

ARTA 2800. Directed Studies in Art. (1-3) Prerequisite: consent of instructor. Directed individual research in a particular artistic field of interest not otherwise offered. May be repeated for credit. *(Fall, Spring, Summer)*

ARTA 3000. Topics in Art. (1-3) Special topic in art. May be repeated for credit with change in topic. *(On demand)*

ARTA 3001. Topics in Art History. (1-3) Special topics in art history. May be repeated for credit with change in topic. *(On demand)*

ARTA 3101. Art Writing. (W) (3) Prerequisite: consent of instructor for non-majors. Priority for Art and Architecture majors. Intensive writing experience in the forms of writing commonly employed in the visual arts: criticism, journalism, historical research, personal essay. *(Fall)*

ARTA 3111. Ancient Art. (3) Prerequisite: ARTA 1211. Survey of the arts and architecture of the ancient western world, from prehistoric times to the fall of the Roman empire. Special emphasis on the interactions of the religious and political systems within the arts as well as identification of cultural styles of art. Discussions of readings, lectures, slides and video tapes. Essay exams. *(Fall) (Alternate years)*

ARTA 3112. Pre-Columbian Art. (3) Prerequisite: ARTA 1211. Survey of the arts and architecture of the Americas before European contact in the 16th century. Special emphasis on the interactions of religion, social systems and the arts as well as identification of ethnic styles of art. Discussions of readings, lectures, slides and video tapes. Essay exams. *(Fall) (Alternate years)*

ARTA 3113. Medieval Art. (3) Prerequisite: ARTA 1211. Survey of the major movements in Europe and the Near East from A.D. 324-1400 with special emphasis on the philosophical background and the interrelationships among the arts of each period. Discussions of readings, lectures, slides and video tapes. Essay exams. *(Spring) (Alternate years)*

ARTA 3114. Renaissance and Baroque Art. (3) Prerequisite: ARTA 1212. Survey of the arts and architecture of Europe and the Colonial world from 1400-1775. Emphasizing the Renaissance philosophy of art, interactions of the Protestant Reformation and Counter Reformation, and the identification of national styles of art. Discussions of readings, lectures, slides and video tapes. Essay exams. *(Spring) (Alternate years)*

ARTA 3117. Art in the US - 1600 - 1900. (3) Prerequisite: ARTA 1212 or consent of instructor. Survey of the major artists and movements in the United States from the Colonial period through 1900, including discussions of cultural contexts and philosophical backgrounds of major styles. *(Fall) (Alternate years)*

ARTA 3118. 19th C. Art in Europe. (3) Prerequisite: ARTA 1212 or consent of instructor. Survey of the major artists and movements in 19th century in Europe, including discussions of cultural contexts and philosophical backgrounds of major artists and styles. *(Fall) (Alternate years)*

ARTA 3119. Art in the US - 1900 - 1940. (3) Prerequisite: ARTA 1212 or consent of instructor. Survey of the major movements in the United States from 1900-1945, with special emphasis on the cultural and philosophical backgrounds of major artists and styles. *(Spring) (Alternate years)*

ARTA 3120. 20th C. Art in Europe. (3) Prerequisite: ARTA 1212 or consent of instructor. Survey of the major movements in 20th century modernist art in Europe from 1900-1945, with special emphasis on the cultural and philosophical backgrounds of major artists and styles. *(Spring) (Alternate years)*

ARTA 3211. Contemporary Art. (3) Prerequisite: ARTA 1212 or consent of instructor. History of the visual arts after 1945 from aesthetic, visual and conceptual perspectives. Selected artists discussed in depth within the artistic and theoretical frameworks of modernism and Post-Modernism. Readings from Modern and contemporary theory. *(Spring)*

ARTA 3212. Contemporary Art Theory. (3) Prerequisites: ARTA 1212 and 2212, or consent of instructor. Major ideas and writings which discuss and interpret the visual arts of the contemporary era; readings in theory and criticism from the postmodern and current periods. *(Spring) (Alternate years)*

ARTA 3400. Internship in the Arts. (1-3) Non-salaried opportunity for students to observe, examine, and participate in the creative dynamics and procedural operations of an art organization, arts related business, professional artist's studio, or expert craftsworker. Sponsor supervised. Six to twelve hours per week. Repeat for credit with different sponsors. Pass/No Credit grade evaluation. *(Fall, Spring, Summer)*

ARTA 3402. Gallery Internship. (3) Participation in all phases of exhibition selection, preparation, and presentation

in four campus galleries under supervision of campus galleries coordinator. An average of eight hours per week for a total of 120 hours. Pass/No Credit grade evaluation. *(Fall, Spring)*

ARTA 3600. Senior Seminar. (WA) (3) Prerequisite: Art majors with senior standing. Seminar and intensive writing experience explores a variety of general issues in contemporary art with an emphasis on career questions faced by graduating seniors. *(Fall, Spring)*

ARTA 3800. Independent Study in Art. (1-3) Prerequisite: consent of instructor. Supervised individual research of artistic problems with appropriate documentation of the results. May be repeated for credit. *(Fall, Spring, Summer)*

ARTA 3801. Visual Arts Workshop. (1-6) Prerequisite: consent of instructor. Contracted and pre-approved arrangements for student to receive credit for visual arts workshops conducted outside the University's course offerings. May be repeated for credit. *(Fall, Spring, Summer)*

Basic Foundation Studios

ARTB 1201. Two-Dimensional Design. (3) The two-dimensional surface and its structural possibilities (i.e., graphics, photography, painting); elements of plastic expression related to increased complexity of space and form. Priority for majors. Six hours. *(Fall, Spring)*

ARTB 1202. Three-Dimensional Design. (3) A beginning studio emphasizing experimentation with design and materials as related to the exploration of form and space in three dimensions. Priority for majors. Six hours. *(Fall, Spring)*

ARTB 1203. Drawing I. (3) Introduction to drawing involving skills and theory including perspective, proportion, and rendering in a variety of media and techniques. Priority for majors. Six hours. *(Fall, Spring)*

ARTB 1205. Figure Drawing I. (3) Prerequisite: ARTB 1203 or consent of instructor. The figure as it relates to form, contour and movement; an anatomical study emphasizing the relationships of skeletal and muscle organization and other referents in the development of graphic skills and vocabulary. Six hours. *(Fall, Spring)*

ARTB 1206. Concepts and Technology. (3) Theory and methods course designed to explore visual literacy using photography and electronic techniques. Six hours. *(On demand)*

Ceramics

ARTC 2175. Ceramics Handbuilding I. (3) Introduction to handbuilt forming methods, concept development, ceramic materials and firing procedures. Six hours. *(Fall, Spring)*

ARTC 2176. Ceramics Wheel I. (3) Introduction to wheel forming methods, and concepts involving skill development, glaze formulation, and basic high-fire techniques. Six hours. *(Fall, Spring)*

ARTC 2275. Ceramic Sculpture. (3) Introductory studio emphasizing larger scale sculptural techniques, concepts and design in fired earthenware clays. Six hours. *(On demand)*

ARTC 2276. Ceramics Wheel II. (3) Prerequisites: ARTC 2176 or consent of instructor. Continuation of Arts 2176 emphasizing development of skills, materials, firing techniques and concepts. Six hours. *(Fall, Spring)*

ARTC 3071. Topics in Ceramics. (1-3) Special topics in ceramics. May be repeated for credit with change in topic. *(On demand)*

ARTC 3175. Ceramics Studio III. (3) Prerequisite: ARTC 2175 or 2176 or consent of instructor. Intermediate development of skills and concepts. More advanced materials and firing techniques. Six hours. *(Fall, Spring)*

ARTC 3176. Ceramics Studio IV. (3) Prerequisite: ARTC 3175. Continuation of ARTS 3175. Six hours. *(Fall, Spring)*

ARTC 3178. Ceramic Materials. (3) Prerequisites/ corequisite: ARTC 3175 or consent of instructor. Ceramic raw material theory and practices related to the development of clay and glaze formulations. Six hours. *(On demand)*

ARTC 3179. Kiln Technology. (3) Prerequisite/ corequisite: ARTC 3175 or consent of instructor. Kiln theory and practices related to ceramic studios. Six hours. *(On demand)*

ARTC 3275. Ceramics Studio V. (3) Prerequisite: ARTC 3176. Advanced ceramic studio of higher level skills, concepts and aesthetics with particular emphasis on personal expression and development of an individual clay portfolio. Six hours. *(Fall, Spring)*

ARTC 3276. Ceramics Studio VI. (3) Prerequisite: ARTC 3271. Continuation of ARTS 3275. Six hours. *(Fall, Spring)*

Drawing

ARTD 2137. Figure Drawing II. (3) Prerequisite: ARTB 1205 or consent of instructor. Emphasizes complex problems and fully developed drawings in a variety of media. Six hours. *(Fall, Spring)*

ARTD 2139. Drawing II. (3) Prerequisite: ARTB 1203 or consent of instructor. Further development of perceptual skills with emphasis on conceptual issues; exploration of subject matter, meaning and content, and thematic development in a variety of black and white and color materials. Six hours. *(Spring)*

ARTD 3035. Topics in Drawing. (1-3) Special topics in drawing. May be repeated for credit with change in topic. *(On demand)*

ARTD 3136. Figure Drawing III. (3) Prerequisite: ARTD 2137 or consent of instructor. Explores humanist and formalist approaches to depicting the figure; multiple figures in environmental situations. Six hours. *(Spring)*

ARTD 3137. Figure Drawing IV. (3) Prerequisite: ARTD 3136 or consent of instructor. Advanced studio using the figure as subject matter. Six hours. *(Spring)*

ARTD 3138. Drawing III. (3) Prerequisites: ARTB 1205 and ARTD 2139 or consent of instructor. Drawing for expression and communication; further development of perceptual and conceptual skills with emphasis on defining an individual direction; mixed media, color, collage, non-traditional materials and surfaces. Six hours. *(Fall)*

ARTD 3139. Drawing IV. (3) Prerequisites: ARTD 3138 or consent of instructor. Advanced studio with emphasis on development of individual direction. Six hours. *(Fall)*

Art Education

ARTE 2121. Developmental Art. (3) Human growth potential, creative and perceptual development, learning objectives, past and current philosophies, and psychology in art. Individual studio problems involving art elements, principles, and media. Six hours. For non-majors only. *(Fall, Spring, Summer)*

ARTE 3021. Topics in Art Education. (1-3) Special topics in art education. May be repeated for credit with change in topic. *(On demand)*

ARTE 3121. Art Education Methods I (K-12). (3) Prerequisite: 24 semester hours of studio art. Analysis of learning theories as related to growth and development in visual arts; organization of tools, media and materials; curriculum design in planning art units and lesson plans; evaluation and motivation techniques. Studio course. Six hours. *(Fall)*

ARTE 3122. Art Education Methods II (K-12). (3) Prerequisite: ARTE 3121. Development of objectives for art education based on personal and historical references, philosophy, and psychology. Relationship of the arts and artists to contemporary society. Curriculum design and classroom management. Six hours. *(Spring)*

ARTE 3467. Student Teaching in Art. (15) Prerequisite: ARTE 3122 and approved application for student teaching; senior status; completion of professional education requirements; grades of *C* or better in all courses required for licensure. Corequisite: enrollment only in student teaching. A planned sequence of experiences in the student's area of specialization conducted in an approved school setting under the supervision and coordination of a university supervisor and a cooperating teacher in which the student demonstrates the competencies identified for his/her specific teaching field in an appropriate grade level setting. *(Fall)*

Fiber

ARTF 2151. Fiber I. (3) Introduction to off-loom weaving processes, emphasizing structure and application of techniques. Course may include frame weaving, basketry, cardweaving, spinning and felting. Six hours. *(Fall, Spring)*

ARTF 2251. Surface Design I. (3) Introduction to surface design and fiber construction. Techniques and concepts involving skill development, basic fiber properties, spinning and dyes. Six hours. *(Fall)*

ARTF 2255. Tapestry. (3) Prerequisite: ARTF 2151 or consent of instructor. Tapestry techniques concentrating on color and design. May be repeated for credit. Six hours. *(On demand)*

ARTF 2256. Rug Weaving. (3) Prerequisite: ARTF 2151. Technical study including warp-faced and weft-faced rugs, pile, and flat woven surfaces. May be repeated for credit. Six hours. *(On demand)*

ARTF 3051. Topics in Fiber. (1-3) Special Topics in fiber. May be repeated for credit with change in topic. *(On demand)*

ARTF 3151. Weaving I. (3) Prerequisite: consent of instructor. Introduction to the loom, procedures for warping, basic techniques including drafting, patterns and color problems; emphasis on technique and structure. Six hours. *(Spring)*

ARTF 3152. Fiber Studio VI. (3) Prerequisite: ARTF 3151 or consent of instructor. Continuation of development of skills, concepts and aesthetics with emphasis on personal expression. Six hours. *(Fall, Spring)*

ARTF 3252. Fiber Studio VII. (3) Prerequisite: ARTS 3152 or consent of instructor. Advanced level fiber techniques and concepts with emphasis on personal expression and development of individual fiber portfolio. Six hours. *(Fall, Spring)*

ARTF 3253. Fiber Studio VIII. (3) Prerequisite: ARTF 3252 or consent of instructor. Continuation of ARTF 3252 with additional emphasis on individual fiber portfolio development. Six hours. *(Fall, Spring)*

Graphic Design

ARTG 2181. Graphic Design I. (3) Prerequisite: ARTB 1201 and 1203. Introduction to basic graphic design and visual communications principles and the history of design. Exploration of equipment, materials, techniques and procedures. Emphasis on concept development and basic layout design skills. Six hours. *(Fall, Spring)*

ARTG 3081. Topics in Graphic Design. (1-3) Special topics in graphic design. May be repeated for credit with change in topic. *(On demand)*

ARTG 3181. Advertising Design. (3) Prerequisite: ARTG 3183. Advanced exploration of solutions to complex, integrated graphic design problems focusing on visual communications for advertising. Professional agency environment and client/business dynamics, design industry issues in contemporary society. Six hours. *(Fall)*

ARTG 3183. Mac for Graphic Design. (3) Prerequisites: ARTM 2105 and ARTG 2181. Hands-on production of pre-press art for Graphic Design usage. Six hours. *(Fall, Spring)*

ARTG 3281. Corporate Design. (3) Prerequisite: ARTG 3183. Advanced exploration of solutions to complex,

integrated graphic design problems with focus on visual communications for corporations. Professional design department environment emphasizes client/business dynamics, project research/development, and creative teams. Design industry contemporary society examined. Six hours. *(Spring)*

ARTG 3287. Exhibition Design. (3) Prerequisites: MSTS 2101 (for Museum Studies Minors), or ARTG 2181 (for Art Majors). Theory, interpretation, design and fabrication of exhibitions for museums, galleries, and other cultural, corporate, educational and public use. Six hours. (Same as MSTS 3203) *(Spring) (Alternate years)*

ARTG 3408. Graphic Design Internship. (3) Prerequisite: ARTS 3281. Placement in a professional setting for observation and supervised design-related duties. An average of ten hours per week for twelve weeks for a total of 120 hours. Written documentation of internship required. Pass/No Credit grade evaluation. *(Fall, Spring, Summer)*

ARTG 3981. Design Project. (3) Prerequisites: ARTG 3181 and 3281. Independent studio course requiring strong design skills. Focus on initiation and implementation of an advanced level project solving a complex artistic problem. Public presentation of project and portfolio refinement required. Six hours. *(Fall, Spring)*

Illustration

ARTL 2186. Illustration I. (3) Prerequisite: ARTB 1205. Survey of the history of illustration and problems in a wide range of media with emphasis on the significant precedents and individuals responsible for shaping the field. Studio projects, demonstrations, and critiques contribute to visual literacy. Six hours. *(Fall, Spring)*

ARTL 3086. Topics in Illustration. (1-3) Special topics in illustration. May be repeated for credit with change in topic. *(On demand)*

ARTL 3186. Illustration: Media/Method. (3) Prerequisite: ARTL 2186. Tools and techniques of illustration including preliminary sketching, photography, library and Internet research. Six hours. *(Fall)*

ARTL 3187. Children's Book Illustration. (3) Prerequisite: ARTL 2186. Survey of layout, research, storyboard, dummy, and finished artwork necessary to create a children's book for presentation to publishers. Come prepared with an idea for a children's book. Six hours. *(Fall) (Alternate years)*

ARTL 3188. The Figure in Illustration. (3) Prerequisites: ARTD 2137 and ARTL 2186. Examination of memory and research techniques to draw the figure in any position or environment. Emphasis on anatomy, form, composition and costume. Six hours. *(Fall) (Alternate years)*

ARTL 3286. Illustration: Sequence/Story. (3) Prerequisite: ARTL 2186. Relationship between words and pictures. Development of a narrative pictorial approach in problems for a wide variety of markets. Single and sequential images as visual solutions. Six hours. *(Spring)*

ARTL 3981. Illustration Project. (3) Prerequisite ARTL 3186 and 3286. Independent studio course requiring strong illustration skills. Focus on initiation and implementation of an advanced level project solving a complex artistic problem. Public presentation of project and portfolio refinement required. Six hours. *(Fall, Spring)*

Multi-Media

ARTM 2105. Electronic Media I. (3) Prerequisites: ARTB 1201 and 1203. Methods of digital and electronic production within a fine arts context, Macintosh hardware and software, an historical overview of electronic artists and artworks, and the Internet as a publishing and research tool. No previous computer experience required. Six hours. *(Fall, Spring, Summer)*

ARTM 3005. Topics in Multi-media. (1-3) Special Topics in multi-media. May be repeated for credit with change in topic. *(On demand)*

ARTM 3103. Animation and Interactivity. (3) Prerequisites: ARTM 2105 or consent of instructor. Methods, tools, and techniques of computer animation, including media creation for the internet and world wide web, Macintosh and multi-media authoring environments such as Micromedia Director and advanced Adobe Photoshop. Six hours. *(Fall)*

ARTM 3104. Installation Art. (3) Prerequisites: ARTB 1201, 1202, and 1203. Techniques and methods of creating Installation Art, from the generation of initial ideas, to experimentation, mockups, and final assembly. Emphasis on the historical and creative issues surrounding the nature and definition of installation art. *(Spring)*

ARTM 3105. Video Art. (3) Prerequisite: ARTM 2105. Video as an art form, including basic techniques of video production and editing, image processing techniques, integration between video and the computer, aesthetic and performance strategies for working in a time-based medium, and survey of the history of video art. *(Spring)*

ARTM 3205. Applied Electronic Media. (3) Prerequisites: ARTT 2291 and 3191 (for Photography Concentration students), or ARTG 3181 and 3281 (for Graphic Design Concentration students) or ATRM 3103 and 3105 (for all other students). Advanced work in video art, interactive environments, and electronic installation art. Course requires significant knowledge of electronic and digital production methods, including video production and multimedia programming. Six hours. *(Fall, Spring)*

ARTM 3405. Internship in Electronic Media. (3) Prerequisite: ARTM 3105 or 3205 or consent of the instructor. Non-salaried opportunity for students to observe, examine and participate in the creative dynamics and procedural operations of an art organization, production house or other arts related business or expert craftsperson dealing with electronic media. Sponsor supervised. Average of eight hours per week for fifteen weeks for a total of 120 hours. Pass/No Credit grade evaluation. *(On demand)*

Painting

ARTP 2131. Painting I. (3) Prerequisite: ARTB 1201 and 1203 or consent of instructor. Basic theory and technique of oil painting. Six hours. *(Fall, Spring)*

ARTP 2133. Watercolor/Mixed Media. (3) Fundamentals of watercolor and related mixed media with emphasis on developing aesthetic understandings, skills in handling painting media and exploration of varied approaches to pictorial solutions. Individual experimentation and expression. May be repeated for credit. Six hours. *(On demand)*

ARTP 3031. Topics in Painting. (1-3) Special topics in painting. May be repeated for credit with change in topic. *(On demand)*

ARTP 3034. Contemporary Painting Issues. (3) Prerequisites: ARTA 1212 or consent of instructor. Advanced seminar focused on critical analysis, stylistic comparison, values, and cultural issues related to contemporary painting. Assigned reading, critical writing, and one extended research project. Three hours. *(On demand)*

ARTP 3131. Abstract Painting. (3) Prerequisite: ARTP 2131. Varieties of abstraction in modern and post-modern painting practice. Principal media are oil and acrylic paints, collage, mixed media. Six hours. *(Fall)*

ARTP 3132. Figure in Painting. (3) Prerequisite: ARTP 2131. Human form as a vehicle for artistic expression in oils, acrylics, and mixed media. Six hours. *(Spring)*

ARTP 3231. Advanced Painting. (3) Prerequisite ARTP 3131, 3132 or consent of instructor. Exploration of issues and concepts of artistic identity and creativity through combined studio/seminar. Advanced painting media/technique instruction. Six hours. *(On demand)*

ARTP 3931. Painting Projects I. (3 or 6) Prerequisite: ARTP 3131 and 3132 or consent of instructor. Studio/seminar research course focused on producing a body of work related to an artistic problem or theme chosen by the student. Six hours. *(Fall, Spring)*

ARTP 3932. Painting Projects II. (6) Prerequisite: ARTP 3931. Continuation of ARTP 3931 culminating in a public exhibition of a body of original art work. Six hours. *(Fall, Spring)*

Printmaking

ARTR 2161. Lithography I. (3) Prerequisites: ARTB 1201 and 1203 or consent of instructor. Introduction to lithographic pencils, crayons, and tusche washes. Basic theory and techniques for hand printing black and white lithographs from stones and plates. Particularly suited to developing drawing skills. Six hours. *(Fall)*

ARTR 2162. Etching & Woodcut I. (3) Prerequisites: ARTB 1201 and 1203 or consent of instructor. Introduction to intaglio techniques of etching, aquatinting, and drypoint, and to relief techniques of woodcut, linocut and inkless embossing. Emphasis on personal imagery along with the expressive potential of the media. Six hours. *(Spring)*

ARTR 2163. Silkscreen I. (3) Prerequisites: ARTS 1201 and 1203 or consent of instructor. Introduction to silkscreen techniques of paper stencil, drawing fluid blockout, crayon, tusche and glue method, and photo emulsion. Emphasis on personal imagery along with the expressive potential of the media. Six hours. *(Spring) (Alternate years)*

ARTR 3061. Topics in Printmaking. (1-3) Special topics in printmaking. May be repeated for credit with change in topic. *(On demand)*

ARTR 3168. Printmaking IV. (3) Prerequisite: one of the following: ARTR 2161, 2162, 2163, or 3061. Development of intermediate skills in any or combined areas of printmaking (i.e., lithography, intaglio, relief, silkscreen, calligraphy, drawing with printed collage, artist's books or monoprinting). Exploration of color printing and a continued survey of image-making techniques. Six hours. *(Fall, Spring)*

ARTR 3169. Printmaking V. (3) Prerequisite: ARTR 3168. Further exploration and development of image-making techniques and printing skills in any or combined areas of printmaking. Special emphasis on artistic themes. Six hours. *(Fall, Spring)*

ARTR 3261. Printmaking VI. (3) Prerequisite: ARTR 3169. Development of advanced skills in any or combined printmaking techniques. Emphasis on the development of individual concepts, themes, and printmaking portfolios. Six hours. *(Fall, Spring)*

ARTR 3262. Printmaking VII. (3) Prerequisite: ARTR 3261. Continuation of ARTR 3261. Six hours. *(Fall, Spring)*

Time Arts/Photography

ARTT 2191. Photographic Media I. (3) Fundamental principles, processes, and aesthetics of photography in black and white and color media. Introduction to photographic color theory, operation of cameras, and basic darkroom techniques. Principles of photography as a means of personal expression. Six hours. *(Fall, Spring, Summer)*

ARTT 2291. Black and White Printing. (3) Prerequisites: ARTB 1201 and ARTT 2191. Continuation of ARTT 2191 with emphasis on contemporary methods, approaches and techniques in silver printing used as a means of creative personal expression. Six hours. *(Spring)*

ARTT 2292. Color Photography. (3) Prerequisite: ARTB 1201 and ARTT 2191. Continuation of ARTT 2191 with emphasis on color negative printing and theory and processes used as a means of creative personal expression. Six hours. *(On demand)*

ARTT 3091. Topics in Time Arts. (1-3) Prerequisite: consent of instructor. Special topics in time arts. May be repeated for credit with change in topic. *(On demand)*

ARTT 3097. Issues in Time Arts. (3) Prerequisite: consent of instructor. Identification of historical, contemporary and future issues affecting the use and

understanding of photography and electronic imaging, including video, when used as a means of personal expression. May repeat for credit with change in topic. *(On demand)*

ARTT 3191. Camera and Light. (3) Prerequisite: ARTB 1201 and ARTT 2191. Principles and practices of small, medium or large format photography, in conjunction with available and studio lighting techniques. Emphasis on personal expression. Six hours. *(Fall)*

ARTT 3193. Alternative Photographic Media. (3) Prerequisite: ARTT 2291. Alternative silver and non-silver photographic media and aesthetics. Experimental studies in the personal and imaginative use of photographic materials. Six hours. *(On demand)*

ARTT 3I95. Time Arts As Documents. (3) Prerequisite: ARTT 2191 or consent of instructor. Examines the nature of time arts documents, considering their sociological, anthropological and artistic qualities. Students are required to study the history and criticism of documentation and to make a document incorporating historical information and contemporary concerns. Six hours. *(On demand)*

ARTT 3291. Advanced Photographic Media. (3) Prerequisite: ARTT 3191 or consent of instructor. Advanced use of the camera as a medium of individual creative expression. Projects in all types of photographic and photographically related media. May be repeated for credit. Six hours. *(On demand)*

ARTT 3409. Internship in Photography. (3) Prerequisite: Consent of instructor. Non-salaried opportunity for students to observe, examine, and participate in the creative dynamics and procedural operations of a photography art organization, photographically related business, or museum studies. Sponsor and faculty supervised. An average of eight hours per week for fifteen weeks for a total of 120 hours. Pass/No Credit grade evaluation. *(Fall, Spring, Summer)*

ARTT 3695. Time Arts Seminar I. (3) Prerequisite: 12 semester hours of photographic requirements, consent of instructor, and corequisite ARTT 3995. A Seminar emphasizing verbal and written criticism of photography and photographically related media. Criticism focused on historical and contemporary bodies of work as well as on students' portfolios. Three lecture hours taken in conjunction with ARTS 3995. *(Fall, Spring)*

ARTT 3696. Time Arts Seminar II. (3) Prerequisites: ARTT 3695, 3995, and corequisite 3996. Continuation of ARTT 3695. Three lecture hours taken in conjunction with ARTT 3996. *(Fall, Spring)*

ARTT 389I. Time Arts Workshop. (I-6) Prerequisite: consent of instructor. Contracted and pre-approved arrangements for student to receive credit for photographic, video, and electronic imaging workshops conducted outside the University's course offerings. May be repeated for credit. Variable hours. *(On demand)*

ARTT 3892. Time Arts Readings. (3) Directed readings in time arts studies, including photography, video and electronic imaging. Emphasis to be placed on the multifaceted nature of time arts media as they are used in the arts and humanities, and on the identification of the major concepts and persons affecting the artistic and critical development of those media. *(On demand)*

ARTT 3995. Time Arts Projects I. (3) Prerequisite: 12 hours of photographic requirements, consent of instructor and corequisite ARTT 3695. Photographic media studio focused on producing a body of work related to an artistic problem or theme chosen and explored as visual research by the student. Six hours taken in conjunction with ARTT 3695. *(Fall, Spring)*

ARTT 3996. Time Arts Projects II. (3) Prerequisite: ARTT 3995, 3695 and corequisite 3696. Continuation of ARTT 3995 plus the requirement to complete a body of original art work and to hold a public exhibition. Six hours taken in conjunction with ARTT 3696. *(Fall, Spring)*

Sculpture

ARTZ 2141. Sculpture I. (3) Prerequisites: ARTB 1202 and 1203 or consent of instructor. Beginning studio exploring three-dimensional forms, concepts and techniques utilizing plaster and wood as sculptural media. Six hours. *(Fall, Spring)*

ARTZ 2146. Metalsmithing/Jewelry I. (3) Prerequisite: ARTZ 1202 or consent of instructor. Beginning studio exploring three-dimensional forms, concepts and techniques utilizing non-ferrous metals in functional design. Six hours. *(Fall, Spring, Summer)*

ARTZ 3041. Topics in Sculpture. (1-3) Special Topics in sculpture. May be repeated for credit with change in topic. *(On demand)*

ARTZ 3046. Topics in Metalsmithing/Jewelry. (1-3) Special topics in metalsmithing. May be repeated for credit with change in topic. *(On demand)*

ARTZ 3I41. Sculpture II. (3) Prerequisite: ARTZ 2141 or consent of instructor. Studio to continue exploration of three-dimensional forms and concepts while introducing more advanced wood-forming processes, basic metal-fabrication techniques, and metal casting. Six hours. *(Fall, Spring)*

ARTZ 324I. Sculpture III. (3) Prerequisites: ARTZ 2175 and 3141 or consent of instructor. Continued exploration of three-dimensional forms and concepts using a combination of media. Introduction of basic forming processes and techniques for plastics and fiberglass. Six hours. *(Fall, Spring)*

ARTZ 3242. Sculpture IV. (3) Prerequisite: ARTZ 3241 or consent of instructor. Continued exploration of three-dimensional forms and concepts. Introduction of advanced metal-fabrication techniques and continued emphasis on mixed-media approach to sculpture making. Six hours. *(Fall, Spring)*

ARTZ 394I. Sculpture Projects I. (6) Prerequisite: ARTZ 3242 or consent of instructor. Exploration of individual directions in sculpture. Six hours. *(Fall, Spring)*

ARTZ 3942. Sculpture Projects II. (6) Prerequisite: ARTZ 394I. Continued exploration of individual directions in sculpture. Six hours. *(Fall, Spring)*

BIOLOGY (BIOL)

Undergraduate

BIOL 1000. Special Topics in Biology. (1-4) Prerequisites: vary with course. Special topics for non-majors in biology. May be repeated for credit as topics vary. Lecture hours and laboratory hours vary by courses taught. *(On demand)*

BIOL 1110. Principles of Biology I. (S) (3) Corequisite: BIOL 1110L. Introduction to biology for non-majors. Fundamental principles of life with a human emphasis. Not accepted toward the major in biology. *(Fall, Spring, Summer)*

BIOL 1110L. Principles of Biology I Laboratory. (S) (1) Prerequisite or corequisite: BIOL 1110. One laboratory period of three hours a week. Not accepted toward the major in biology. *(Fall, Spring, Summer)*

BIOL 1115. Principles of Biology II. (S) (3) Prerequisite: BIOL 1110 or consent of instructor. Corequisite: BIOL 1115L. Continuation of BIOL 1110 for non-majors. Fundamental principles of life with a human emphasis. *(Fall, Spring)*

BIOL 1115L. Principles of Biology II Laboratory. (S) (1) Prerequisite or corequisite: BIOL 1115. One laboratory period of three hours a week. *(Fall, Spring)*

BIOL 1222. Plant Biology. (3) Corequisite: BIOL 1222L. The morphology, function, reproduction, phylogeny and ecology of plants. *(Fall, Spring)*

BIOL 1222L. Plant Biology Laboratory. (1) Prerequisite or corequisite: BIOL 1222. One laboratory period of three hours a week. *(Fall, Spring)*

BIOL 1233. Animal Biology. (3) Corequisite: BIOL 1233L. The morphology, function, development, phylogeny and ecology of the principal invertebrate and vertebrate types. *(Fall, Spring)*

BIOL 1233L. Animal Biology Laboratory. (1) Prerequisite or corequisite: BIOL 1233. One laboratory period of three hours a week. *(Fall, Spring)*

BIOL 1259. Bacteriology. (3) Prerequisite: BIOL 1110 and one semester of chemistry. Basic physiology of bacteria, fungi, protozoa and viruses, with emphasis on host-parasite interaction and control and epidemiology of infectious diseases. Not accepted toward the major in biology. *(Fall, Spring, Summer)*

BIOL 1259L. Bacteriology Laboratory. (1) Prerequisite or corequisite: BIOL 1259. One laboratory period of three hours a week. Not accepted toward the major in biology. *(Fall, Spring, Summer)*

BIOL 1273. Human Anatomy and Physiology. (3) Prerequisites: CHEM 1203, 1204 (formerly CHEM 1103, 1104). Fundamentals of the anatomy and physiology of the human body. Not accepted toward the major in biology. *(Fall, Summer)*

BIOL 1273L. Human Anatomy and Physiology Laboratory. (1) Prerequisite or corequisite: BIOL 1273. One laboratory period of three hours a week. Not accepted toward the major in biology. *(Fall, Summer)*

BIOL 1274. Human Anatomy and Physiology II. (3) Not accepted toward the major in biology. Prerequisite: BIOL 1273. Continuation of BIOL 1273. Students cannot receive credit for both BIOL 1274 and BIOL 3273. *(Spring, Summer)*

BIOL 1274L. Human Anatomy and Physiology Laboratory II. (1) Prerequisite or corequisite: BIOL 1274. One laboratory period of three hours a week. *(Spring, Summer)*

BIOL 2000. Special Topics in Biology. (1-4) Prerequisites: vary with course. Special introductory topics for biology majors. May be repeated for credit as topics vary. Lecture hours and laboratory hours will vary with the courses taught. *(On demand)*

BIOL 2111. Cell Biology. (3) Prerequisite: BIOL 1222, 1233 and their labs; prerequisite or corequisite CHEM 2131 + lab; corequisite BIOL 2111L. Structure and function of cells. *(Fall, Spring)*

BIOL 2111L. Cell Biology Laboratory. (1) Prerequisite or corequisite: BIOL 2111. One laboratory period of three hours a week. *(Fall, Spring)*

BIOL 3000. Special Topics in Biology. (1-4) Prerequisite: vary with course. Special topics for intermediate level majors in biology. May be repeated for credit as topics vary. Lecture hours and laboratory hours will vary with the courses taught. *(On demand)*

BIOL 3144. Ecology. (3) Prerequisites: BIOL 1222 and 1233. Interrelationships of organisms and their environment. *(Fall, Spring)*

BIOL 3144L. Ecology Laboratory. (1) Prerequisite or corequisite: BIOL 3144. One laboratory period of three hours a week. *(Fall, Spring)*

BIOL 3166. Genetics. (3) Prerequisite: BIOL 2111. Basic concepts of heredity; principles of classical, molecular, and population genetics. *(Fall, Spring, Summer)*

BIOL 3166L. Genetics Laboratory. (1) Prerequisite or corequisite: BIOL 3166. One laboratory period of three hours a week. *(Fall, Spring)*

BIOL 3202. Horticulture. (3) Prerequisite: BIOL 1222. Principles of horticulture, greenhouse management, environmental factors, production and maintenance of cultivars, and landscaping. *(Fall)*

BIOL 3202L. Horticulture Laboratory. (1) Prerequisite or corequisite: BIOL 3202. Greenhouse work, plant identification, and field trips. One laboratory period of three hours a week. *(Fall)*

BIOL 3215. Economic Botany. (W) (3) Prerequisite: BIOL 1222. Origins of agricultural plants; history of use and misuse of plants by humans; consideration of major groups of crop, spice, medicinal, and drug plants. *(Spring)*

BIOL 3229. Field Botany. (3) Prerequisite: BIOL 1222 and consent of department. A field course stressing identification, classification and habitat of the vascular plants, particularly of the Piedmont, but also including the Coastal Plain and the mountains of North Carolina. Six hours a day for 10 days. *(Summer)*

BIOL 3231. Invertebrate Zoology. (4) Prerequisite: BIOL 1233. Taxonomy, anatomy, physiology and life histories of selected invertebrates. Three lecture hours and one laboratory period of three hours a week. *(On demand)*

BIOL 3233. Vertebrate Zoology. (4) Prerequisite: BIOL 1233. Taxonomy, anatomy, physiology and life histories of vertebrates. Three lecture hours and one laboratory period of three hours a week. *(Fall)*

BIOL 3234. Field Entomology. (3) Prerequisite: BIOL 1233 or consent of department. A field course stressing identification and ecology of insects of the Piedmont of North Carolina. Six hours a day for 10 days. *(Summer)*

BIOL 3272. Plant Physiology. (3) Prerequisites: BIOL 2111. Metabolic and physiological processes of plants and conditions which affect or regulate these processes. *(Fall)*

BIOL 3272L. Plant Physiology Laboratory. (1) Prerequisite or corequisite: BIOL 3272. One laboratory period of three hours a week. *(Spring)*

BIOL 3273. Animal Physiology. (3) Prerequisite: BIOL 2111. Fundamental control mechanisms that operate to maintain the homeostatic state. Students cannot receive credit for both BIOL 1274 and BIOL 3273. *(Fall, Spring)*

BIOL 3273L. Animal Physiology Laboratory. (1) Prerequisite or corequisite: BIOL 3273. One laboratory period of three hours a week. *(Fall, Spring)*

BIOL 3405. Internship in Community Education and Service. (1-3) Prerequisites: junior standing, acceptance into program and approval of department. A project-oriented, service-learning internship with a community organization. The Department of Biology has the option of recognizing this credit as fulfilling departmental requirements and granting permission to repeat for credit. Maximum credit toward major is three hours. *(Fall, Spring, Summer)*

BIOL 3500. Biology Cooperative Education Experience. (0) Prerequisite: approval by the department and the University Career Center. Required of students participating in the Cooperative Education Program during the semesters in which they are working. Course may be repeated. *(Fall, Spring)*

BIOL 3501. Biology Cooperative Education Seminar. (1) Prerequisite: participation in BIOL 3500. Required of students in the semester following each Cooperative Education work experience. Student presentations of oral and written reports. *(Fall, Spring)*

BIOL 3800. Tutorial in Biology. (1-4) Prerequisite: consent of department. Enables junior and senior biology majors to engage in directed study in their fields of interest. Maximum credit toward major: two hours for B.A.; four hours for B.S. May be repeated for credit. *(Fall, Spring, Summer)*

BIOL 3900. Undergraduate Research (1-4) Prerequisite: consent of the department. Enables junior and senior biology majors to initiate research projects in their respective fields of interest. Maximum credit toward major: two hours for B.A.; four hours for B.S. May be repeated for credit as topics vary. May substitute for only one lab. *(Fall, Spring, Summer)*

Undergraduate/Available for Graduate Credit

BIOL 4000. Special Topics in Biology. (1-4) (1-4G) Prerequisites and credit hours vary with topics. Special topics for advanced undergraduates. May be repeated for credit as topics vary. Lecture hours and laboratory hours will vary with the courses taught. *(Fall, Spring)*

BIOL 4110. Methods in Biological Electron Microscopy. (3) (3G) Prerequisites: BIOL 4171 or 4291, two area requirements and consent of Department. A laboratory-oriented course in the methodology and applications of transmission and scanning electron microscopy. Two laboratory periods of three hours each a week and three additional laboratory hours. *(Fall)*

BIOL 4111. Evolution. (W) (3) (3G) Prerequisites: BIOL 3166. Theories of evolution and forces which affect gene frequencies. *(Fall)*

BIOL 4121. Biometry. (4) (4G) Prerequisite: one course in statistics. Design and analysis of experiments. Three lecture hours and one laboratory period of three hours a week. *(Spring)*

BIOL 4149. Limnology and Oceanography. (4) (4G) Prerequisites: BIOL 1222 and 1233. Geological, physical, chemical and biological aspects of lakes, streams, estuaries and oceans. Three lecture hours and one laboratory period of three hours a week. *(Fall)*

BIOL 4168. Recombinant DNA Techniques. (3) (3G) Prerequisite: BIOL 3166 or CHEM 4165, and permission of the instructor. Modern molecular biological methods (such as DNA cloning, gel electrophoresis, nucleic acid hybridization, PCR, and DNA sequencing) data analysis and interpretation. One lecture hour and two laboratory periods of three hours a week. *(Fall)*

BIOL 4171. Cell Physiology. (3) (3G) Prerequisites: BIOL 2111. The fundamental physicochemical properties of cells. *(Fall)*

BIOL 4184. Plant Biotechnology. (3) (3G) Prerequisite: BIOL 2111, 3166 and CHEM 2132 or consent of department. A laboratory-oriented course designed to integrate plant molecular biology, recombinant DNA technology, and plant cell and tissue culture. One lecture hour and two laboratory periods of three hours a week. *(Spring) (Alternate years)*

BIOL 4189. Mechanisms in Development. (3) (3G) Prerequisite: BIOL 4283 or permission of the department. Cellular and molecular bases of differentiation; an exploration of the experimental analysis of causal and controlling factors in development. *(Spring)*

BIOL 4I99. Molecular Biology. (3) (3G) Prerequisites: BIOL 3166 and CHEM 2132. Structural and functional interaction of nucleic acids and proteins in the replication, transcription and translation of genetic material. *(Fall)*

BIOL 4205. Advanced Horticulture. (3) (3G) Prerequisite: BIOL 3202. Topics in ornamental horticulture and landscaping, including greenhouse projects and field trips. Two lecture hours and three hours of lab a week. *(Spring)*

BIOL 4221. Plant Systematics. (4) (4G) Prerequisite: BIOL 3166. Identification and classification of vascular plants, including experimental concepts of speciation. Three lecture hours and one laboratory period of three hours a week. *(Spring)*

BIOL 4223. The Fungi. (W) (3) (3G) Prerequisite: BIOL 2111; Consent of department for graduate credit. Morphology, life cycles, ecology, taxonomy, and medical economic significance of the fungi and organisms historically aligned with the fungi. *(On demand)*

BIOL 4223L. The Fungi Laboratory. (1) (1G) Co-requisite/prerequisite: BIOL 4223; Consent of department for graduate credit. One laboratory period of three hours a week. *(On demand)*

BIOL 4229. Dendrology. (4) (4G) Prerequisite: BIOL 4221. The identification, structure, function, ecology, reproduction, and evolutionary relationships of woody plants. Three lecture hours and one three-hour lab a week. *(Fall)*

BIOL 4233. Parasitology. (4) (4G) Prerequisite: BIOL 1233. Morphology, life cycles, ecology, taxonomy and economic importance of parasites. Three lecture hours and one laboratory period of three hours a week. *(Spring)*

BIOL 4234. Wildlife Biology. (W) (3)(3G) Prerequisite: BIOL 3144. Concepts, principles and techniques of wildlife biology. Identification and life histories with emphasis on the value, study attraction, management, conservation and control of wildlife species. *(On demand)*

BIOL 4234L. Wildlife Biology Laboratory. (1)(1G) Prerequisite or corequisite: BIOL 4234. One laboratory period of three hours a week plus field trips. *(On demand)*

BIOL 4235. Mammalogy. (4)(4G) Prerequisite: BIOL 3233 or 4293. Taxonomy, anatomy, physiology and life histories of the mammals. Three lecture hours and one laboratory period of three hours a week. *(Fall)*

BIOL 4243. Animal Behavior. (3) (3G) Prerequisite: BIOL 1233. An ethological approach to how animals respond to their environment. Causation, development and adaptive significance of behavior in social systems. *(Fall)*

BIOL 4243L. Animal Behavior Laboratory. (I) (1G) Prerequisite or corequisite: BIOL 4243. One laboratory period of three hours a week. *(Fall)*

BIOL 4244. Conservation Biology. (W) (3) (3G) Prerequisite: BIOL 3144. Conservation values, extinction rates, genetic diversity, demography, habitat fragmentation, reserve management, ecological restoration. *(Yearly)*

BIOL 4244L. Conservation Biology Laboratory. (1) (IG) Prerequisite or corequisite: BIOL 4244. One laboratory period of three hours a week plus field trips. *(Yearly)*

BIOL 4250. Microbiology. (3) (3G) Prerequisites: BIOL 2111. Morphology, physiology, pathogenicity, metabolism and ecology of micro-organisms. *(Fall)*

BIOL 4250L. Microbiology Laboratory. (I) (IG) Prerequisite or corequisite: BIOL 4250. One laboratory period of three hours a week. *(Fall)*

BIOL 4251. Immunology. (3) (3G) Prerequisites: BIOL 3166. Cellular, molecular and genetic basis for immunity; physical chemistry of antigens and antibodies and their interactions; defense mechanisms. *(Spring, Summer)*

BIOL 4251L. Immunology Laboratory. (1) (1G) Prerequisite or corequisite: BIOL 4251. One laboratory period of three hours a week. *(Spring)*

BIOL 4252. Monoclinal Antibodies/Production and Purification. (3) (3G) Prerequisites or corequisites: BIOL 4251, or consent of the department. A laboratory-oriented course devoted to the theory and procedures for the production and utilization of monoclinal antibodies and the associated techniques for protein isolation and characterization. One lecture hour and two laboratory periods of three hours a week. *(Fall)*

BIOL 4253. Marine Microbiology. (4) (4G) Prerequisites: BIOL 4250 and 4250L. Bacteria, fungi and viruses of marine origin, and their response to the salt, temperature, pressure and nutrient environment of the ocean. Roles of marine microorganisms in public health, pollution and fouling. Three lecture hours and one laboratory period of three hours a week. *(Spring)*

BIOL 4254. Epidemiology. (3) (3G) Prerequisite: BIOL 1259 or 4250. History and practices of epidemiology with emphasis on modes of transmission of clinically important infectious agents and the analysis of epidemiological data. Three lecture hours a week. *(On demand)*

BIOL 4256. Pathogenic Bacteriology. (3) (3G) Prerequisite: BIOL 4250. Cellular and molecular interactions of mammalian hosts with procaryotic parasites. *(Spring)*

BIOL 4256L. Pathogenic Bacteriology Laboratory. (I) (IG) Prerequisite: BIOL 4250L. Prerequisite or corequisite: BIOL 4256. One laboratory period of three hours a week. *(Spring)*

BIOL 4257. Microbial Physiology and Metabolism. (4) (4G) Prerequisites: BIOL 4250 and 4250L. A laboratory-oriented course covering such topics in general microbiology as the preparation and use of cell-free systems, isolation of auxotrophs, transport mechanisms, etc. Lectures in microbial metabolism and physiology and reading on recent development in microbiology. Two,

one-hour lectures and two, two-hour laboratory periods per week. *(Spring)*

BIOL 4259. Virology. (3) (3G) Prerequisites: BIOL 4250, 4250L and CHEM 2132. Morphology, classification, genetics and pathogenicity of bacterial and animal viruses. *(Fall)*

BIOL 4259L. Virology Laboratory. (1) (1G) Prerequisite or corequisite: BIOL 4259. One laboratory period of three hours per week. *(Fall)*

BIOL 4277. Endocrinology. (3) (3G) Prerequisites: BIOL 3273. Endocrine glands and their physiological roles in metabolism, growth and reproduction. *(On demand)*

BIOL 4277L. Endocrinology Laboratory. (1) (1G) Prerequisite or corequisite: BIOL 4277. One laboratory period of three hours a week. *(On demand)*

BIOL 4282. Developmental Plant Anatomy. (3) (3G) Prerequisite: BIOL 2111. Study of plant cells, tissues, organs and patterns of growth and differentiation. *(Spring)*

BIOL 4282L. Developmental Plant Anatomy Laboratory. (1) (1G) Prerequisite or corequisite: BIOL 4282. One laboratory period of three hours a week. *(Spring)*

BIOL 4283. Animal Development. (3) (3G) Prerequisite: BIOL 2111. Developmental processes occurring chiefly during gametogenesis, fertilization, early embryogenesis and organogenesis. *(Fall)*

BIOL 4283L. Animal Development Laboratory. (1) (1G) Prerequisite or corequisite: BIOL 4283. One laboratory period of three hours a week. *(Fall)*

BIOL 4291. Histology. (4) (4G) Prerequisite: BIOL 2111. Animal tissues and organs; techniques of preparing tissues for analysis. Three lecture hours and one laboratory period of three hours a week. *(Spring)*

BIOL 4293. Comparative Vertebrate Anatomy. (4) (4G) Prerequisite: BIOL 1233. Comparative studies of the anatomy, physiology and functional adaptations of selected vertebrates with emphasis on evolutionary developments, especially in mammals. Three lecture hours and one laboratory period of three hours a week. *(Spring)*

BIOL 4600. Seminar. (1) (1G) Prerequisite: Senior standing. Required of all majors. Student presentation of oral and written reports from pertinent biological literature. May be repeated for credit. *(Fall, Spring)*

BIOL 4700. Honors Research I. (3) (3G) Prerequisite: Senior status. Independent honors project. By invitation. *(Fall, Spring, Summer)*

BIOL 4701. Honors Research II. (3) (3G) Prerequisite: BIOL 4700. Independent honors project: thesis preparation and seminar presentation. May be substituted for BIOL 4600 and for only one lab. *(Fall, Spring, Summer)*

Graduate and Advanced Undergraduate

BIOL 5000. Advanced Topics in Biology. (1-4) (1-4G) Prerequisite: a minimum of two area requirements in biology or consent of Department. Courses in selected topics and advanced studies in biology. Lecture and laboratory hours will vary with the topics taught. May be repeated for credit as topics vary. *(Fall, Spring)*

BIOL 5144. Advanced Ecology. (W) (4) (4G) Prerequisite: BIOL 3144. Energy flow, nutrient cycles, community structure, population growth and regulation. Three lecture hours and one laboratory period of three hours a week. *(Fall)*

BIOL 5279. Neurobiology. (3) (3G) Prerequisite: BIOL 3273. Physiology and anatomy of nervous systems, especially mammalian. *(Spring)*

BIOL 5279L. Neurobiology Laboratory. (1) (1G) Prerequisite or corequisite: BIOL 5279. One laboratory period of three hours a week. *(Spring)*

BIOL 5291. Advances in Immunology. (3) (3G) Prerequisite: BIOL 4251, or consent of department. Current topics in immunology with particular emphasis upon the genetic systems and molecular mechanisms underlying immune reactions. Additional work required by graduate students. *(Fall)*

Graduate Only

BIOL 6000. Special Topics in Biology. (1-4G) Prerequisite: consent of department. Courses in selected topics and advanced studies in biology. Lecture and laboratory hours will vary with the courses taught. *(On demand)*

BIOL 6010. Special Topics in Microbiology. (1-4G) Prerequisite: consent of department. Advanced courses in microbiology. May be repeated for credit as topics vary. Lecture and laboratory hours will vary with the courses taught. *(On demand)*

BIOL 6020. Special Topics in Systematic Biology. (1-4G) Prerequisite: consent of department. Advanced courses in systematic and evolutionary biology. May be repeated for credit as topics vary. Lecture and laboratory hours will vary with the courses taught. *(On demand)*

BIOL 6030. Special Topics in Genetics. (1-4G) Prerequisite: consent of department. Advanced courses in genetics. May be repeated for credit as topics vary. Lecture and laboratory hours will vary with the courses taught. *(On demand)*

BIOL 6040. Special Topics in Molecular Biology. (1-4G) Prerequisite: consent of department. Advanced courses in biochemistry and molecular biology. May be repeated for credit as topics vary. Lecture and laboratory hours will vary with the courses taught. *(On demand)*

BIOL 6050. Special Topics in Physiology. (1-4G) Prerequisite: consent of department. Advanced courses in physiology. May be repeated for credit as topics vary. Lecture and laboratory hours will vary with the courses taught. *(On demand)*

BIOL 6060. Special Topics in Developmental Biology. (1-4G) Prerequisite: consent of department. Advanced

courses in developmental biology and embryology. May be repeated for credit as topics vary. Lecture and laboratory hours will vary with the courses taught. *(On demand)*

BIOL 6070. Special Topics in Anatomy. (1-4G) Prerequisite: consent of department. Advanced courses in anatomy and morphology. May be repeated for credit as topics vary. Lecture and laboratory hours will vary with the courses taught. *(On demand)*

BIOL 6080. Special Topics in Behavior. (1-4G) Prerequisite: consent of department. Advanced courses in behavior. May be repeated for credit as topics vary. Lecture and laboratory hours will vary with the courses taught. *(On demand)*

BIOL 6090. Special Topics in Ecology. (1-4G) Prerequisite: consent of department. Advanced courses in ecology. May be repeated for credit as topics vary. Lecture and laboratory hours will vary with the courses taught. *(On demand)*

BIOL 6600. Seminar. (1-2G) Topics of current emphasis in biology. May be repeated for credit. *(Fall, Spring)*

BIOL 6800. Tutorial. (1-4G) Directed study in areas of specialization in biology and related fields. Maximum credit toward degree: four hours. Offered on a *Pass/No Credit* or *IP* basis only. *(Fall, Spring)*

BIOL 6900. Research and Thesis. (1-8G) *Pass/No Credit* or *IP* grading only. *(Fall, Spring)*

BUSINESS LAW (BLAW)

Undergraduate

BLAW 3150. Business Law I. (3) Prerequisite: junior standing. A study of the legal setting of business and its relationship to the business firm. Topics covered include: the nature of law and the court system, torts, contracts, commercial paper, consumer credit, sales, partnerships, corporations, the employer-employee relationship, real and personal property. *(Fall, Spring, Summer) (Evenings)*

BLAW 3200. Legal Environment in Business. (3) Legal environment in which business operates today; Legal, social, and ethical considerations of managers within the framework of federal and state regulatory laws; role and function of federal regulatory agencies and their impact on business activities. (Formerly MBAD 6181. *(Fall, Spring)*

BLAW 3250. Business Law II. (3) Prerequisite: BLAW 3150. The study of the Uniform Commercial Code. Subjects covered include sale of goods, commercial paper, bank deposits and collections, letters of credit, bulk transfers, documents of title, investment securities and secured transactions. *(Fall, Spring)*

BLAW 3252. Construction Law. (3) Prerequisite: junior standing. Examination of the legal problems encountered by architects, engineers, contractors, owners, sureties and lenders involved in the construction process. Special emphasis on the legal rights and liabilities of the various participants in construction projects. Claims preparation, negotiation, arbitration and litigation methods of dispute resolution. *(On demand)*

BLAW 3253. International Business Transactions. (3) Prerequisites: BLAW 3150, junior standing. An examination of the role of law in developing and conducting international business. Topics covered will include Multinational Enterprises, International Trading of Goods, Regional Economic Communities, Import/ Export Regulation, Technology Transfer, and Inter-national Dispute Settlement. *(On demand)*

BUSINESS HONORS (BUSN)

BUSN 3780. Business Honors Seminar. (3) Prerequisites: permission of the Business Honors Program Coordinator. Exploration of current topics in business and the methods of research appropriate to them. Includes class presentations by key individuals from the business community. Development of research project proposal for Business Honors Thesis (BUSN 3790). *(Spring)*

BUSN 3790. Business Honors Thesis. (3) Prerequisites: BUSN 3780 and permission of Business Honors Coordinator. Honors project directed by Business Honors committee or assigned faculty member. One faculty contact hour per week and independent research. *(On demand)*

CIVIL ENGINEERING (CEGR)

Undergraduate

CEGR 2101. Civil Engineering Drawing. (2) Prerequisite: ENGR 1202. Introduction to engineering drawing in the environmental, geotechnical, transportation, and structural sub-disciplines of civil engineering, including sketching, principles of mechanical drawing, and computer aided drawing (CAD). CAD utilizes the MOSAIC computing environment. One hour of lecture and three hours of laboratory per week. *(Fall)*

CEGR 2102. Engineering Economic Analysis. (2) Prerequisite: ENGR 1201. Economic analysis of engineering solutions; present and annual worth analysis; cost benefit analysis; internal rate of return analysis; bonds and cost estimating. Three hours per week. *(Spring)*

CEGR 2103. Civil Engineering Measurements and Analysis. (2) Prerequisite: ENGR 1201. Introduction to laboratory and field data collection techniques for stress and strain, heights and distance, area and volume, and flow measurements including data analysis, data presentation and report writing. One hour of lecture and three hours of laboratory per week. *(Fall)*

CEGR 2104. Surveying and Site Design. (3) Prerequisite: ENGR 1202. Elements of plane surveying including taping, use of level, transit, theodolite, and total station; topographical surveying and mapping; error adjustment; area and volume computations; introduction to photogrammetry; site development including site location, geometry, conditions, design, layout, and regulatory requirements; computer applications. One hour of lecture and 3 hours of laboratory per week. *(Spring)*

CEGR 2154. Design Project Lab. (2) Prerequisite: CEGR 2103. Corequisite: CEGR 2102. Problem

definition, evaluation of design alternatives, design concepts, conceptual design, forensic engineering, reverse engineering and value engineering. Students work together in teams to find, present, and defend their solutions to real world civil engineering problems. One hour of lecture and 3 hours of laboratory per week. *(Spring)*

CEGR 3090. Special Topics in Civil Engineering. (1-4) Examination of specific new areas emerging in the various fields of civil engineering based upon and synthesizing knowledge students have gained from the engineering science, mathematics and physical science stems of the core curriculum. May be repeated for credit. *(On demand)*

CEGR 3122. Structural Analysis. (3) Prerequisites: ESGR 3141 and MATH 2171 and junior standing. Corequisite: CEGR 2152. Analysis of statically determinate and indeterminate beams, trusses and frames to include shear and moment diagrams, rough deflected shapes and deflections; influence lines and criteria for moving loads; indeterminate analyses to include methods of consistent deflection, slope deflection and moment distribution. *(Spring)*

CEGR 3141. Introduction to Environmental Engineering. (3) Prerequisite: MATH 2171, CHEM 1251, and junior standing. Corequisite: CEGR 3155. Environmental engineering concepts, including stream pollution analysis, water and wastewater treatment processes; solid and hazardous waste management practices; pollution problems and controls; mass balance analyses, and review of pertinent legislation. *(Fall)*

CEGR 3143. Hydraulics and Hydrology. (3) Prerequisite: CEGR 2104 and junior standing. Corequisite: CEGR 3141. Fluid properties, pressure, closed-conduit flow, pipe networks, pumps, open channel flow, weirs, orifices, flumes; hydrologic cycle-evaporation, precipitation, runoff, groundwater flow, stream flow; flow measurement. *(Fall)*

CEGR 3153. Transportation Laboratory. (1) Corequisite: CEGR 3161. Design of transportation systems including highways, airports, pipelines and mass transit; route layout, geometric design and earthwork calculations; computer-aided system simulation and evaluation. One hour of lecture and three hours of laboratory per week. *(Fall)*

CEGR 3155. Environmental Laboratory. (W) (1) Prerequisite: CHEM 1251L. Corequisite: CEGR 3141. Laboratory problems in environmental engineering. Emphasis on analysis and presentation of results as well as on the significance of results as they affect theory and/or practice. One hour of lecture and three hours of laboratory per week. *(Fall)*

CEGR 3161. Transportation Engineering I. (3) Prerequisite: MATH 2241; CEGR 2102, 2103, 2104, and junior standing. Corequisite: CEGR 3153. Analysis of transportation facilities; planning, location and economic considerations, with special emphasis on land transportation. *(Fall)*

CEGR 3201. Systems and Design I. (3) Prerequisite: senior standing in Civil Engineering, CEGR 2154, and 3 of the following: CEGR 3122, 3141, 3161, 3278. Systems engineering techniques applied to civil engineering problems emphasizing methodological considerations and engineering projects carried out by small groups of students. *(Fall)*

CEGR 3202. Systems and Design II. (1) Prerequisite: CEGR 3201. Continuation of CEGR 3201. Creatively investigate and produce alternative solutions for a comprehensive engineering project resulting in written and verbal class presentations. Three hours of laboratory per week. *(Spring)*

CEGR 3212. Computer Applications in Civil Engineering. (3) Prerequisite: senior standing in Civil Engineering. Application of digital computers and numerical methods to various types of civil engineering problems. Examinations in depth of selected civil engineering problems. *(On demand)*

CEGR 3221. Structural Steel Design I. (3) Prerequisites: CEGR 3122 and ESGR 2144. Corequisite: CEGR 3255. Analysis and design of structural steel components with emphasis on theories necessary for a thorough understanding of the design procedure. Design philosophies and types of steel structures. Columns, tension members and laterally supported beams are considered. General flexural theory including bending of unsymmetrical sections. Current AISC Specifications used. *(Fall)*

CEGR 3225. Reinforced Concrete Design I. (3) Prerequisite: CEGR 3122. Corequisite: CEGR 3255. Analysis and design of reinforced concrete components with emphasis on fundamental theories. Mechanics and behavior of reinforced concrete. Flexural members to include singly and doubly-reinforced beams of various cross sections (rectangular, T-beams, joists, one-way slabs and others). Shear in beams and columns. Short columns to include uniaxial and biaxial bending. Construction of short column interaction diagrams. Introduction to footings. Current ACI Specifications. *(Fall)*

CEGR 3232. Urban Engineering. (3) Prerequisite: consent of department. An examination of those societal problems of metropolitan regions most amenable to engineering solutions. Current urban literature will be reviewed in seminar, and selected topics amenable to engineering analysis will be studied. Written reports will be presented. *(On demand)*

CEGR 3255. Structural Materials Laboratory I. (W) (1) Corequisites: CEGR 3221 or 3225. Composition, properties, and testing of: wood, natural and artificial aggregates, bitumins, portland cement concrete, pozzolans, and structural metals. Data analysis, presentation, and report writing. One hour of lecture and three hours of laboratory per week. *(Fall)*

CEGR 3258. Geotechnical Laboratory. (W) (l) Corequisite CEGR 3278. Tests to determine engineering properties of soils; consistency, permeability, shear strength and consolidation. Data analysis, presentation and report writing. One hour of lecture and three hours of laboratory per week. *(Spring)*

CEGR 3278. Geotechnical Engineering. (3) Prerequisite: PHYS 2221L, MATH 2171, and ESGR 2144. Corequisite: CEGR 3258. Principles of soil mechanics to include

consistency, permeability, seepage, stress in soils, consolidation, shear strength, retaining structures, slope stability and foundations. Integration of design and technical reporting. *(Spring)*

CEGR 3282. Professional Development. (1) Prerequisite: senior standing in Civil Engineering. A series of one-hour lectures by faculty and invited speakers on basic concepts of professionalism and the nature and purpose of engineering ethics. *Pass/No Credit grading.* (*Spring*)

CEGR 3695. Civil Engineering Cooperative Education Seminar. (1) Required of Co-op students during semesters immediately following each work assignment for presentation of engineering reports on work done the prior semester. *(Fall, Spring, Summer)*

CEGR 3890. Individualized Study. (1-3) Prerequisite: consent of the department. Supervised individual study within an area of a student's particular interest which is beyond the scope of existing courses. *(On demand)*

CEGR 3990. Undergraduate Research in Civil Engineering. (1-4) Prerequisite: consent of the department. This course involves independent study of a theoretical and/or experimental problem in a specialized area of Civil Engineering. May be repeated for credit. *(On demand)*

Undergraduate/Available for Graduate Credit
Additional work required for graduate credit.

CEGR 4141. Process Engineering. (3) (3G) Prerequisite: CEGR 3141 or consent of the department. Applications of material and energy balance principles to the study of chemical, biological and environmental engineering processes. Overview of applied biotechnology, engineering thermodynamics and kinetics. *(Fall)*

CEGR 4142. Water/Wastewater Engineering. (3) (3G) Prerequisite: CEGR 3141. Analysis and design of water and wastewater treatment processes including: physical, chemical and biological treatment; and treatment and disposal of sludge. Computer-aided design of treatment systems. Control of toxic and hazardous wastes. *(Spring)*

CEGR 4144. Solid Waste Management. (3) (3G) Prerequisite: CEGR 3141 or consent of the department. Solid waste management, sources, generation rates, processing and handling, disposal, recycling, landfill closures, and remedial actions for abandoned waste sites. *(Spring) (Alternate years)*

CEGR 4146. Groundwater Resources Engineering. (3) (3G) Prerequisite: CEGR 3141 or consent of the department. Overview of hydrological cycle. Principles of groundwater flow and well hydraulics. Regional groundwater flow and flow nets. Water chemistry and contamination. Applications of groundwater modeling. *(Fall) (Alternate years)*

CEGR 4162. Transportation Planning. (3) (3G) Prerequisite: CEGR 3161. Urban transportation; travel characteristics of urban transportation systems; analysis of transportation-oriented studies; analytic methods of traffic generation, distribution, modal split and assignment; traffic flow theory. *(On demand)*

CEGR 4181. Human Factors in Traffic Engineering. (3) (3G) Prerequisite: CEGR 3161 or consent of the department. Study of the driver's and pedestrian's relationship with the traffic system, including roadway, vehicle and environment. Consideration of the driving task, driver and pedestrian characteristics, performance and limitations with regard to traffic facility design and operation. *(On demand)*

CEGR 4182. Transportation Environmental Assessment. (3) (3G) Prerequisites: Senior standing and consent of department. A study of the environmental impact analysis and assessment procedures for transportation improvements. Route location decisions. Noise, air quality, socio-economic, and other impacts. (*On demand*)

CEGR 4183. Traffic Engineering Studies. (3)(3G) Prerequisite: CEGR 3161 or consent of department. Introduction to the traffic engineering studies most used by traffic engineers including data collection techniques, statistical analysis procedures, report writing and presentation. One hour of lecture and three hours of laboratory per week. *(On demand)*

CEGR 4185. Geometric Design of Highways. (3) (3G) Prerequisite: CEGR 3152. Theory and practice of geometric design of highways including intersections, interchanges, parking and drainage facilities. Driver ability, vehicle performance, safety and economics are considered. Two hours of lecture and three laboratory hours per week. (*On demand*)

CEGR 4222. Structural Steel Design II. (3) (3G) Prerequisite: CEGR 3221. Analysis and design of structural steel components and systems with emphasis on theories necessary for a thorough understanding of the design of complete structures. Compression members affected by local buckling, beams with lateral-torsional buckling, continuous beams and beam columns are covered. Welded and bolted connections. Current AISC Specifications used. *(Spring)*

CEGR 4224. Advanced Structural Analysis. (3) (3G) Prerequisite: CEGR 3122. A continuation of CEGR 3121. Fundamental and special methods of analysis of statically determinate and indeterminate structures. Topics include deflection theory, energy theory, variable cross-section analysis, multistory moment distribution. *(Fall)*

CEGR 4226. Reinforced Concrete Design II. (3) (3G) Prerequisite: CEGR 3225. Analysis and design of reinforced concrete components and systems with emphasis on the fundamental theories necessary for a thorough understanding of concrete structures. Concentrically loaded slender columns, slender columns under compression plus bending. Wall footings and column footings. Analysis of continuous beams and frames. Total design project involving the analysis and design of a concrete structure. Current ACI Specifications used. *(Spring)*

CEGR 4241. Water and Wastewater Treatment: Process Chemistry. (3) (3G) Prerequisites: CHEM 1252 (Formerly

CHEM 1102) and CEGR 3141, or consent of the department. Chemical principles involved in the treatment of water and wastewaters; principles of chemical equilibrium relevant to natural water systems; the nature and effect of chemical interactions of domestic and industrial waste effluents on natural water systems. (*On demand*)

CEGR 4262. Traffic Engineering. (3)(3G) Prerequisite: CEGR 3161 or consent of the department. Operation and management of street and highway systems. Traffic control systems, traffic flow theory, and highway capacity. Evaluation of traffic engineering alternatives and the conduct of traffic engineering studies. *(Spring)*

CEGR 4270. Pavement Design. (3) (3G) Prerequisites: CEGR 3161 and 3278, or consent of the department. Pavement design concepts and considerations; engineering properties of pavement materials including soils, bases, asphalt concrete, and portland cement concrete; design of flexible and rigid pavements including shoulders and drainage; computer applications for pavement analysis and design. (*On demand*)

CEGR 4278. Geotechnical Engineering II. (3) (3G) Prerequisites: CEGR 3258 and 3278, or consent of the department. Design of shallow and deep foundations, including structural considerations; lateral earth pressure theories; design of rigid and flexible earth retaining structures; advanced aspects of slope stability analysis; and computer applications. (*Fall*)

Graduate and Advanced Undergraduate

The 5000-level courses are first-year graduate courses although advanced seniors may enroll with permission of the department.

CEGR 5090. Special Topics in Civil Engineering. (1-4) (1-4G) Study of specific new areas emerging in the various fields of civil engineering. May be repeated for credit. *(On demand)*

CEGR 5108. Finite Element Analysis and Applications. (3) (3G) Prerequisite: consent of department. Finite element method and its application to engineering problems. Application of displacement method to plane stress, plane strain, plate bending and axisymmetrical bodies. Topics include but are not limited to dynamics, heat transfer, fluid mechanics, structural mechanics, and electric fields. (Dual-listed with MEGR 5108.) *(Spring)*

CEGR 5121. Prestressed Concrete Design. (3) (3G) Prerequisites: CEGR 3225 and 4224 or consent of the department. Analysis and design of prestressed components and systems, including materials and systems for prestressing, loss of prestress, flexural and shear design in accordance with current building codes, analysis of indeterminate prestressed systems, and control of camber, deflection and cracking. *(Spring) (Alternate years)*

CEGR 5122. Advanced Topics in Structural Steel. (3) (3G) Prerequisites: CEGR 4222 or consent of the department. Theory of plastic-behavior of steel structures; current topics in structural steel. *(On demand)*

CEGR 5123. Bridge Design. (3) (3G) Prerequisites: CEGR 3221 and 3225, or consent of the department. Review of bridge design codes and loadings; superstructure and substructure design of short, intermediate, and long span bridges constructed of steel and concrete; earthquake design; segmental and cable-stayed bridges. *(Spring) (Alternate years)*

CEGR 5124. Masonry Design. (3) (3G) Prerequisites: CEGR 3225 or consent of the department. Introduction of masonry materials and engineering and materials properties and testing procedures. Design of reinforced and unreinforced masonry (clay and concrete) walls, beams, and columns for vertical, wind, and seismic loads. Analysis and design of masonry structures (including torsion) and introduction to computer applications. *(Spring) (Alternate years)*

CEGR 5126. Fracture Mechanics and Fatigue. (3) (3G) Prerequisites: CEGR 3221 or consent of the department. Introduction to fracture mechanics and fatigue, including Griffith Theory, plan strain-stress conditions, critical stress intensity factors, factors influencing fracture toughness, fracture mechanics design principles, fatigue performance, and fatigue initiation and propagation. *(Fall) (Alternate years)*

CEGR 5128. Matrix Methods of Structural Analysis. (3) (3G) Prerequisite: consent of department. Derivation of the basic equations governing linear structural systems. Application of stiffness and flexibility methods to trusses and frames. Solution techniques utilizing digital computer. *(Fall) (Alternate years)*

CEGR 5141. Bioprocess Technology. (3) (3G) Prerequisites: CEGR 4141 and general microbiology, or consent of the department. Introduction to metabolic pathways, growth kinetics and reactor theories. Laboratory investigation of the operation, optimization and scale-up problems associated with batch and continuous culture of microorganisms. Process analysis and modeling of environmental engineering processes. *(Spring)*

CEGR 5142. Waste Incineration. (3) (3G) Prerequisite: consent of the department. Fundamentals of incineration of hazardous/solid wastes. Thermochemical applications and equipment design. Computer modeling of the incineration process and air quality control. *(Spring)*

CEGR 5144. Engineering Hydrology. (3) (3G) Prerequisite: consent of the department. A quantitative study of the various components of the water cycle, including precipitation, runoff, ground water flow, evaporation and transpiration, stream flow. Hydrograph analysis, flood routing, frequency and duration, reservoir design, computer applications. *(On demand)*

CEGR 5146. Advanced Engineering Hydraulics. (3) (3G) Prerequisite: CEGR 3143 or consent of the department. Problems of fluids as applied in civil engineering; open channel flow; dams and spillways; water power; river flow and backwater curves; pipe networks, fire flow, sewage collection, groundwater, and computer applications. *(On demand)*

CEGR 5161. Advanced Traffic Engineering. (3) (3G) Prerequisite: CEGR 3161 or consent of the department. Analysis of basic characteristics of drivers, vehicles and roadway that affect the performance of road systems. Stream flow elements, volume, density, speed. Techniques of traffic engineering measurements, investigations and data analysis, capacity analysis. Intersections, accidents, parking. *(On demand)*

CEGR 5165. Urban Systems Engineering. (3) (3G) Prerequisite: CEGR 3202 or consent of the department. Survey of economic, political, sociological and technological factors affecting modern growth; a planning process and its role in solving selected urban problems with emphasis on engineering contributions. *(On demand)*

CEGR 5171. Urban Public Transportation. (3) (3G) Prerequisite: CEGR 3161 or consent of the department. Planning, design, and operation of bus, rail, and other public modes. Relationship between particular modes and characteristics of urban areas. Funding, security and other administrative issues. *(Fall) (Alternate years)*

CEGR 5181. Highway Safety. (3) (3G) Prerequisite: CEGR 3161 or consent of the department. Engineering responses at the state and local levels to the problem of highway safety. Extent of the highway safety problem, elements of traffic accidents, common accident countermeasures, collection and analysis of accident data, evaluation of safety-related projects and programs, and litigation issues. *(Fall) (Alternate years)*

CEGR 5232. Bioenvironmental Engineering. (3) (3G) Prerequisites: CEGR 3141 or consent of the department. Theoretical principles and design of aerobic and anaerobic biological unit processes for renovating waters and wastewaters. Activated sludge, aerated and facultative lagoons, rotating biological contractors, trickling and anaerobic filters. *(On demand)*

CEGR 5234. Hazardous Waste Management. (3) (3G) Prerequisite: CEGR 3141 or consent of the department. Integration of scientific and engineering principles with legislation, regulation and technology in the management of hazardous wastes. Study of thermal, chemical, physical and biological systems and processes used in the treatment of hazardous wastes and the remediation of hazardous waste sites. *(On demand)*

CEGR 5235. Industrial Pollution Control. (3) (3G) Prerequisite: consent of the department. Source and characterization of industrial wastewaters. Fundamentals of chemical and physical treatment processes. Biological treatment technologies. Waste minimization and reduction technologies. Sludge handling and toxicity reduction. Implementation of field or laboratory treatability study. *(Fall) (Alternate years)*

CEGR 5236. Watershed Analysis. (3) (3G) Prerequisite: consent of the department. Study of NPS problems in urban and non-urban watersheds and from highway runoff. Estimate of sediment yield and design of BMP's including sediment control structures. Introduction to monitoring and modeling of hydrologic systems. Watershed modeling in a GIS environment. *(Spring) (Alternate years)*

CEGR 5237. Environmental Risk Management. (3) (3G) Prerequisite: consent of the department. Review of legislation and requirements pertaining to spills and releases of chemicals to the environment. Fundamentals of fires, explosions, toxic emissions and dispersion, hazardous spills, and other accidents. Study of techniques for accident prevention and spill control, and hazardous and risk assessment. *(Fall) (Alternate years)*

CEGR 5241. Environmental Aquatic Chemistry. (3) (3G) Prerequisite: CHEM 3111 or CHEM 3141, or equivalent, or consent of the department. Concepts of chemical equilibria applied to natural aquatic systems. Topics include acid-base reactions, buffer systems, mineral precipitation, coordinate chemistry, redox reactions, adsorption phenomena and chemical-equilibria computer programs. *(Spring) (Alternate years)*

CEGR 5243. Topics in Environmental Health. (3) (3G) Prerequisites: CEGR 3141 and 4142, or consent of the department. Study of contemporary environmental health problems and practices as they relate to groundwater pollution, food and water-borne diseases, radiological health, occupational health and risk assessment. Provides an introduction to epidemiology and toxicology, and a historical review of federal environmental policy and legislative action. *(On demand)*

CEGR 5252. Soil Dynamics and Earthquake Engineering. (3) (3G) Prerequisites: CEGR 3122 and 3278, or consent of department. Review of the dynamics of single and multi degree of freedom systems. Earthquake mechanism, distribution, magnitude, intensity, ground shaking, site effects, prediction, and response spectra. Soil liquefaction; aseismic design of foundations; seismic codes; and machine foundation design. *(On demand)*

CEGR 5264. Landfill Design and Site Remediation. (3) (3G) Prerequisites: CEGR 3258 and 3278, or consent of the department. Principles of waste disposal and sanitary landfill siting including design, construction, operation and maintenance. Site assessment of underground storage tank leaks; site remediation, and clean up technologies using choice and economic analysis and computer applications. *(Spring) (Alternate years)*

CEGR 5268. Advanced Soil Mechanics. (3) (3G) Prerequisites: CEGR 3258 and 3278, or consent of the department. One and two-dimensional consolidation, layered strata effects, and creep; seepage in layered strata, flow net, and seepage forces; shear strength parameters, effective and total stress paths, and application for slope stability evaluation; principles of critical state soil mechanics; computer applications. *(On demand)*

CEGR 5270. Earth Pressures and Retaining Structures. (3) (3G) Prerequisites: CEGR 3122 and 3278 or consent of the department. Earth pressure theories, effects of wall friction and external loads (including earthquake); design of rigid retaining walls (including structural details); sheetpile

wall design; soil reinforcement systems for retaining structures; computer applications. (*On demand*)

CEGR 5272. Design with Geosynthetics. (3) (3G) Prerequisites: CEGR 3258 and 3278 or consent of the department. Types and properties of geosynthetics. Design with geosynthetics for filtration, separation, drainage, seepage control, stabilization, soil reinforcement and barriers. Computer applications in design. *(Fall) (Alternate years)*

CEGR 5892. Individualized Study and Projects. (1-6) (1-6G) Prerequisites: consent of the department. Individual investigation and exposition of results. May be repeated for credit. (*On demand*)

CEGR 5991. Graduate Research in Civil Engineering. (1-4) (1-4G) Prerequisite: consent of the department. Independent study of a theoretical and/or experimental problem in a specialized area of civil engineering. May be repeated for credit. *(On demand)*

Graduate Only
CEGR 6090. Special Topics in Civil Engineering. (1-6G) Directed study of current topics of special interest. May be repeated for credit. *(On demand)*

CEGR 6126. Analysis of Plates and Shells. (3G) Prerequisite: CEGR 4224, or consent of the department. Analysis of rectangular and circular plates using classical as well as numerical methods; orthotropic and continuous plates and plate buckling. Analysis of thin shells and shells of revolution with and without bending; membrane theory of cylindrical shells; symmetric and unsymmetric loading; pipes, tanks, and pressure vessels; computer applications. *(On demand)*

CEGR 6128. Structural Optimization. (3G) Prerequisites: CEGR 4224, or consent of the department. Introduction to optimization concepts; reformulation of common structural analysis and design problems to an optimization format; optimization of constrained, unconstrained, linear, and nonlinear problems by classical and numerical techniques; and computer applications. *(On demand)*

CEGR 6129. Structural Dynamics. (3G) Prerequisite: CEGR 3122 or consent of the department. Analysis and design of structures subject to dynamic and static loading, single degree of freedom approach, vibration of structural components including damping and elasto-plastic behavior. *(On demand)*

CEGR 6141. Water Quality Modeling. (3G) Prerequisite: consent of the department. Mathematical modeling of water quality in receiving streams including: generation of point and nonpoint sources of pollution; formulation of transport equations for contaminants in stream and estuarine water; and prediction of the fate, persistence and transformation of chemical pollutants in aquatic ecosystems. Computer model simulation and case studies. *(On demand)*

CEGR 6144. Environmental Biotechnology. (3G) Prerequisite: Consent of the department. Application of biotechnology to the management of environmental problems. Study of bioprocess principles, bioremediation of waste disposal sites, cell immobilization technology and innovative biotechnologies. *(On demand)*

CEGR 6146. Advanced Groundwater Analysis. (3G) Prerequisite: Consent of the department. Modeling of groundwater flow in saturated and unsaturated zones. Contaminant transport including advection, dispersion and numerical modeling. Groundwater remediation technology. *(On demand)*

CEGR 6147. Storm Water Modeling. (3G) Prerequisite: Consent of the department. Characterization of non point source pollution; modeling of flow and pollutant transport in storm runoff; application of U.S. EPA Stormwater Management Model and U.S. Soil Conservation Service Models. *(On demand)*

CEGR 6148. Water Conservation. (3G) Prerequisites: Consent of the department. Principles and issues concerning water conservation and methods for effecting water conservation, including residential, industrial, commercial, and agricultural water conservation; water rates, audits and reuse/reclamation as they relate to water conservation; and case studies. *(On demand)*

CEGR 6161. Traffic Control and Operation. (3G) Prerequisite: CEGR 5161 or consent of the department. Traffic control theory and application; traffic regulation, laws and ordinances; speed control, intersection control, flow control and parking control; design and application of control devices, investigation, evaluation techniques; statistical analysis; administration. (*On demand*)

CEGR 6171. Air Quality Control. (3G) Prerequisite: consent of the department. Study of various types of air pollutants, their sources, nature and effects. Examination of air quality criteria, standards and monitoring. Analysis of feasibility, applicability and efficiency of diverse systems of control. Evaluation of goal and research needs in the future. *(On demand)*

CEGR 6172. Air Dispersion Modeling. (3G) Prerequisites: Consent of the department. Atmospheric pollution problems, federal regulations, boundary layer meteorology, dispersion theory, gaussian model, plume rise formulas, air toxics, and computer modeling of point area, line and mobile sources. *(On demand)*

CEGR 6181. Traffic Flow Theory. (3G) Prerequisite: CEGR 5161 or consent of the department. Logical foundations and mathematical representation of traffic flow; interrelation between microscopic and macroscopic equations of motion for highway traffic; stochastic properties of traffic at low and moderate densities. Car-following theories of traffic flow at high densities. Applications of queuing theory. *(On demand)*

CEGR 6182. Transportation Systems Analysis. (3G) Prerequisite: CEGR 5161 or consent of the department. Issues, concepts and methods of transportation systems engineering and planning. Decision making in transportation management. The application of analytical methods to the development and evaluation of transport systems. *(On demand)*

CEGR 6261. Traffic Signal Control Systems. (3G) Prerequisite: CEGR 6161 or consent of the department. Study of control systems for isolated intersections, arterial streets, closed networks, and freeways. Emphasis on computer models; state-of-the-art detection, control, and communications equipment and software; and intelligent vehicle/highway systems. *(Fall)*

CEGR 6892. Individualized Study and Projects. (1-6G) Individual investigation and exposition of results. May be repeated for credit. *(On demand)*

CEGR 6991. Graduate Thesis Research. (1-6G) Individual investigation culminating in the preparation and presentation of a thesis. May be repeated for credit. *(On demand)*

CHEMISTRY (CHEM)

Separate lecture and laboratory sections--Although the laboratory and lecture sections of CHEM 1111, 1112, 1203, 1204, 1251, 1252, 2131 and 2132 are taught as separate courses, it is strongly recommended that students take the appropriate laboratory concurrently with the lecture. Students with severe scheduling problems or students with course programs that do not require the laboratory may take the lecture without the laboratory. Retention of a laboratory after withdrawing from its associated lecture requires departmental approval. **Students using CHEM 1111 and 1112 or CHEM 1203 and 1204 or CHEM 1251 and 1252 to satisfy the general education requirements for the B.A. and B.S. degree must also take the associated laboratory courses.**

Undergraduate

CHEM 1111. Chemistry in Today's Society. (S) (3) For students not majoring in a physical or biological science, engineering, or science-oriented preprofessional program. Qualifies as a prerequisite only for CHEM 1112. The role of chemistry in society and the impact of chemistry on society. An introduction to the chemical concepts needed to understand many of the numerous scientific problems confronting society today. Three lecture hours and one Problem Session hour per week. (Credit will be given for only one course: 1111, 1203, or 1251.) *(Fall, Summer)*

CHEM 1111L. Laboratory in Chemistry. (S) (1) Prerequisite or corequisite CHEM 1111. Laboratory exercises to demonstrate what chemists do, techniques used in the laboratory, and the limitations inherent in any laboratory experiment. One three-hour laboratory per week. (Credit will be given for only one course: 1111L, 1203L, or 1251L.) *(Fall, Summer)*

CHEM 1112. Chemistry in Today's Society. (S) (3) Prerequisite CHEM 1111. Continuation of CHEM 1111. Does not qualify as a prerequisite for any other chemistry course. Three lecture hours and one Problem Session hour per week. (Credit will be given for only one course: 1112, 1204 or 1252.) *(Spring, Summer)*

CHEM 1112L. Laboratory in Chemistry. (S) (1) Prerequisite: CHEM 1111 and 1111L. Prerequisite or corequisite: CHEM 1112. Continuation of CHEM 1111L. One three-hour laboratory per week. (Credit will be given for only one course: 1112L, 1204L, or 1252L.) *(Spring, Summer)*

CHEM 1203. General Chemistry. (S) (3) (Formerly CHEM 1103) Primarily for nursing majors. Qualifies as a prerequisite only for CHEM 1204. Fundamentals of chemistry and selected topics from inorganic chemistry. Three lecture hours and one Problem Session hour per week. (Credit will be given for only one course: 1111, 1203, or 1251.) *(Fall, Summer)*

CHEM 1203L. General Chemistry Laboratory. (S) (1) (Formerly CHEM 1103L) Prerequisite or corequisite: CHEM 1203. Laboratory investigations into the nature of inorganic compounds. One three-hour laboratory per week. (Credit will be given for only one course: 1111L, 1203L, or 1251L.) *(Fall, Summer)*

CHEM 1204. General Chemistry. (S) (3) Prerequisite: CHEM 1203. Continuation of CHEM 1203, with emphasis on organic chemistry and selected topics in biochemistry. Does not qualify as a prerequisite for any other chemistry course. Three lecture hours and one Problem Session hour per week. (Credit will be given for only one course: 1112, 1204, or 1252.) *(Spring, Summer)*

CHEM 1204L. General Chemistry Laboratory. (S) (1) Prerequisites: CHEM 1203 and 1203L. Perquisite or corequisite: CHEM 1204. Continuation of CHEM 1203L with emphasis on the reactions and characterization of organic compounds. One three-hour laboratory per week. (Credit will be given for only one course: 1112L, 1204L, or 1252L. *(Spring, Summer)*

CHEM 1251. Principles of Chemistry. (S) (3) Prerequisite: Chemistry Placement Test to determine section placement. A principles-oriented course for science majors. Fundamental postulates and laws of chemistry; the relationship of atomic structure to physical and chemical properties of the elements. Three lecture hours and one Problem Session hour per week. (Credit will be given for only one course: 1111, 1203, or 1251.) *(Fall, Spring, Summer)* *(Evenings)*

CHEM 1251L. Principles of Chemistry Laboratory (S) (1) Prerequisite or corequisite: CHEM 1251. Experimental investigations involving the fundamental postulates and laws of chemistry. One three-hour laboratory per week. (Credit will be given for only one course: 1111L, 1203L, or 1251L.) *(Fall, Spring, Summer)* *(Evenings)*

CHEM 1252. Principles of Chemistry. (S) (3) Prerequisite: CHEM 1251. Continuation of CHEM 1251. Three lecture hours and one Problem Session hour per week. (Credit will be given for only one course: 1112, 1204, or 1252.) *(Fall, Spring, Summer)* *(Evenings)*

CHEM 1252L. Principles of Chemistry Laboratory. (S) (1) Prerequisites: CHEM 1251 and 1251L. Prerequisite or corequisite: CHEM 1252. Continuation of CHEM 1251L. One three-hour laboratory per week. (Credit will be given for only one course: 1112L, 1204L, or 1252L.) *(Fall, Spring, Summer)* *(Evenings)*

CHEM 1253L. Introduction to Modern Laboratory Methods. (S) (1) Prerequisite or corequisite: CHEM 1252. For students planning to take additional chemistry courses; can be substituted for the 1252L requirement for all degrees in chemistry. Open-ended studies on topics compatible with

CHEM 1252 lecture materials. A quasi-research approach is used, involving modern instrumentation extensively. The background needed to utilize microcomputers in data acquisition and data reduction is presented. One three-hour laboratory per week. (*Spring*)

CHEM 2125. Inorganic Chemistry. (3) Prerequisite: CHEM 1252 with a grade of *C* or better. Descriptive inorganic chemistry including acid-based and non-aqueous solvent concepts. (*Spring*)

CHEM 2131. Organic Chemistry. (3) Prerequisite: CHEM 1251 and 1252, each with a grade of *C* or better. Descriptive principles and techniques of organic chemistry and their applications to reactions of aliphatic and aromatic compounds and natural products. (*Fall, Spring, Summer*)

CHEM 2131L. Organic Chemistry Laboratory. (1) Prerequisites: CHEM 1251, 1251L, 1252, 1252L, each with a grade of *C* or better. Prerequisite or corequisite: CHEM 2131 with a grade of C or better. Laboratory investigations into the physical and chemical properties of organic compounds. One laboratory period of three hours per week. (*Fall, Spring, Summer*)

CHEM 2132. Organic Chemistry. (3) Prerequisite: CHEM 2131 with a grade of *C* or better. Continuation of CHEM 2131. Three lecture hours and one Problem Session hour per week. (*Fall, Spring, Summer*)

CHEM 2132L. Organic Chemistry Laboratory. (1) Prerequisite: CHEM 2131L with a grade of *C* or better. Prerequisite or corequisite: CHEM 2132. Continuation of CHEM 2131L. One laboratory period of three hours per week. (*Fall, Spring, Summer*)

CHEM 2136L. Organic Chemistry Laboratory. (1) Prerequisite or corequisite: CHEM 2132. Laboratory investigation involving a research-type project in lieu of CHEM 2132L. Available only upon departmental invitation. (*On demand*)

CHEM 2141. Survey of Physical Chemistry. (3) Prerequisites: CHEM 1252, 1252L with grades of *C* or better, MATH 1120 or one semester of calculus (high school or higher), PHYS 1101 or one semester of physics (high school or higher). A course designed for students in the life sciences or others desiring a one-semester survey of the physical aspects of chemistry. Application of thermodynamics to chemical reactions, energy transfer processes, and chemical and physical equilibria; the study of reaction rates and mechanisms; structure of gases, liquids and solids; molecular structure and spectroscopy. (*Spring*)

CHEM 3090. Special Topics in Chemistry. (1-4) Prerequisite: consent of department. Topics chosen from analytical, biochemistry, inorganic, organic and physical chemistry. May be repeated for credit. Lecture and/or laboratory hours will vary with the nature of the course taught. (*On demand*)

CHEM 3111. Quantitative Analysis. (4) Prerequisites: CHEM 1252, 1252L with grades of *C* or better. Introductory to quantitative and analytical chemistry. Principles of equilibrium, classical and simple instru-mental approaches are considered. Two lecture hours and two laboratory periods of three hours each week. (*Fall*)

CHEM 3112. Modern Separation Techniques. (4) Prerequisites: CHEM 2131, 2131L and 3111 with grades of *C* or better. A theoretical and application course in modern separation techniques with emphasis on liquid and gas chromatography. Two lecture hours and two laboratory periods of three hours each week. (*Spring*) (*Alternate years*)

CHEM 3113. Survey of Instrumental Methods of Analysis. (4) Prerequisites: CHEM 3111 with a grade of *C* or better. Methods of instrumental analysis with emphasis on sample handling, instrument parameters, data handling, and trouble-shooting in various areas that include Potentiometry, Spectroscopy, Mass Spectrometry, and Chromatography. Either CHEM 3113 or 3112, but not both, may be used to meet requirements for the BA degree. Credit will not be given for both CHEM 3113 and 4111. Two lecture hours and two three-hour laboratory periods per week. (*Spring*)

CHEM 3141. Physical Chemistry. (3) Prerequisites: CHEM 1252, 1252L with a grade of C or better; MATH 1241 and 1242; PHYS 2231 and 2231L. Prerequisite or corequisite: At least one of the following: MATH 2241, 2242, 2164, 2171, 3125, or a department-approved mathematics course. Quantum chemistry, atomic and molecular structure, spectroscopy. (*Fall*)

CHEM 3141L. Physical Chemistry Laboratory. (1) Prerequisite or corequisite: CHEM 3141. Experiments in laser spectroscopy, quantum mechanics, kinetics, and thermodynamics. One laboratory period of three hours per week. (*Fall*)

CHEM 3142. Physical Chemistry. (3) Prerequisites: CHEM 1252, 1252L with a grade of C or better; MATH 1241 and 1242; PHYS 2231 and 2231L. Prerequisite or corequisite: At least one of the following: MATH 2241, 2242, 2164, 2171, 3125, or a department-approved mathematics course. Kinetic theory of gases, statistical and classical thermodynamics, kinetics. (*Spring*)

CHEM 3142L. Physical Chemistry Laboratory. (1) Prerequisite: CHEM 3141L with a grade of *C* or better. Prerequisite or corequisite: CHEM 3141 or 3142. Continuation of CHEM 3141L. One laboratory period of three hours per week. (*Spring*)

CHEM 3197. Internship in Community Education and Service. (1-3) Prerequisites: Junior standing, acceptance into the program and approval of department. A project-oriented, service learning internship with a cooperating community organization. (Credit toward the B.A. and B.S. degrees in chemistry will not be given.) May be repeated for credit with Department permission. Offered on a *Pass/No Credit* basis only. (*On demand*)

CHEM 3500. Chemistry Cooperative Education Experience. (0) Prerequisites: Junior standing, chemistry through 2132 and acceptance into the Cooperative Education Program. Enrollment in this course is required for chemistry majors during each semester or summer when they are working on a co-op assignment. May be repeated. Evaluation is S/U. (*On demand*)

CHEM 3695. Chemistry Seminar. (W) (1) Introduction to typical search methods, including computer searching, for the chemical reference works and chemical literature. Use of these search techniques for background development. Writing short papers on assigned topics in journal format. One three hour laboratory session per week. *(Spring)*

Undergraduate/Available for Graduate Credit

CHEM 4111. Instrumental Analysis. (4) (4G) Prerequisites: CHEM 3111, 3141, 3141L with a grade of *C* or better. Selected modern instrumental methods of analysis, including theory and practice, with considerable attention given to the instrument and elementary electronics involved in the techniques. Two lecture hours and six hours of lab per week. *(Spring)*

CHEM 4112. Applied Microcomputer Interfacing in Chemistry. (4) (4G) Prerequisite: Departmental approval. Presentation of the background needed to apply computer interfacing in chemical research, including machine language programming and elementary digital electronics, and discussion of application of computer automation in chemical research. The laboratory illustrates solutions to solving interfacing problems. No background in programming or electronics required. Three lecture hours and one lab period of three hours each week. *(Spring) (Alternate years)*

CHEM 4121. Advanced Inorganic Chemistry. (4) (4G) Prerequisites: CHEM 3142, 3142L with a grade of *C* or better. Theoretical inorganic chemistry including the application of physicochemical principles to the study of inorganic systems. Laboratory work involves inorganic preparations and characterization techniques. Three lecture hours and one laboratory period of three hours a week. *(Fall)*

CHEM 4133. Methods of Organic Structure Determination. (2) (2G) Prerequisites: CHEM 2132, 2132L with grade of *C* or better. Study and application of modern techniques, primarily spectroscopy, to determine the structure of organic molecules. One hour of lecture and one laboratory period of three hours each week. *(Spring)*

CHEM 4134. Organic Reaction Mechanisms. (2) (2G) Prerequisites: CHEM 2132, 2132L with grade of *C* or better. Mechanistic and theoretical topics which are beyond the scope of CHEM 2131/2132, including orbital symmetry control of organic reactions, the Hammett Equation and other linear free energy relationships, heterocyclic compounds, polycyclic aromatic compounds, organic photochemistry, carbines, nitrenes, arynes and other short lived, reactive intermediates. *(Spring) (Alternate years)*

CHEM 4135. Concepts and Techniques in Organic Synthesis. (2) (2G) Prerequisite or corequisite: CHEM 4133. Modern techniques of organic synthesis. Laboratory includes one or more multi-step syntheses of complex molecules. One hour of lecture and one laboratory period of three hours each week. *(Spring) (Alternate years)*

CHEM 4145. Advanced Physical Chemistry. (3) (3G) Prerequisite: CHEM 3142 with a grade of *C* or better. Topics selected from quantum chemistry and/or statistical thermodynamics. *(On demand)*

CHEM 4165. Principles of Biochemistry I. (3) (3G) Prerequisite: CHEM 2132 with a grade of *C* or better. A study of the structures, properties, and functions of biological molecules, bioenergetics of biological reactions, and enzyme catalysis, with particular emphasis on the underlying chemical principles, including thermodynamics and kinetics. *(Fall)*

CHEM 4165L. Principles of Biochemistry I Laboratory. (1) (1G) Prerequisite: CHEM 2132L with a grade of *C* or better. Prerequisite or corequisite: CHEM 4165. Physical properties of biological molecules and an introduction to experimental techniques of biochemical research. Eleven four-hour lab periods. *(Fall)*

CHEM 4166. Principles of Biochemistry II. (3) (3G) Prerequisite: CHEM 4165 with a grade of *C* or better. A study of various metabolic pathways and information transfer including molecular aspects of cell biology and genetics, with particular emphasis on the underlying chemical reactions, including thermodynamics and kinetics. *(Spring)*

CHEM 4171. Biochemical Instrumentation. (4) (4G) Prerequisites: CHEM 4165 and 4165L with a grade of *C* or better or the consent of the department. Modern instrumental methods used in biorelated arcas such as biochemistry, biotechnology and medical technology. Theory and practice. Potentiometry, spectrophotometry, chromatography, sedimentation, and electrophoresis. Two lecture hours and two three-hour laboratory periods per week. *(Spring)*

CHEM 4175. Physical Biochemistry. (3) (3G) Prerequisites: CHEM 4165, 4165L, 4166, and 3141 with a grade of *C* or better. Colloid systems, equilibria in biological fluids, mass and energy transport in fluids and in association with membranes, energy storage and dissipation with relation to specific chemical bonding, enzyme kinetics. *(On demand)*

CHEM 4200. Computational Chemistry. (4) (4G) Prerequisite (BA): CHEM 2125 or 2141 or consent of instructor. Prerequisite or corequisite (BS and MS): CHEM 3141 or consent of instructor. Electronic and molecular mechanics-based computational methods, including properties, optimized equilibrium and transition state structures and potential energy surfaces of reactions. Three lecture hours and three hours of laboratory each week. Additional projects required of graduate students. *(Fall, Spring)*

CHEM 4695. Chemistry Seminar. (W) (1) (1G) Prerequisite: CHEM 3695 and senior standing. Discussion of recent developments and special topics in chemistry. Written and oral reports are required. May be repeated for credit. *(Fall, Spring)*

CHEM 4900. Directed Undergraduate Research. (1-4) (1-4G) Prerequisite: consent of the instructor overseeing the research. Independent study and research in any of these fields of chemistry: organic, physical, analytical, inorganic chemistry or biochemistry. Hours for laboratory and library

work to be determined. May be repeated for credit. (*Fall, Spring, Summer*)

Graduate and Advanced Undergraduate
CHEM 5090. Special Topics in Chemistry. (1-4) (1-4G) Prerequisite: consent of the instructor. Selected topics in chemistry. Lecture and/or laboratory hours will vary with the nature of the course taught. May be repeated for credit. *(On demand)*

CHEM 5165. Structure and Mechanism in Protein Chemistry. (3) (3G) Prerequisites: CHEM 4165, and either CHEM 4166 or BIOL 4171, or consent of the instructor. Examination of structures, properties, and functions of proteins, enzyme catalysis, and bioenergetics, emphasizing underlying mechanistic chemical and biochemical principles. *(Spring) (Alternate years)*

CHEM 5185. Chemical Fate of Pollutants. (3) (3G) Prerequisites: Senior or Graduate Standing and CHEM 2132. Chemical reactivity and fate of pollutants (in air, water, soil) in terms of their chemical structure and energetics, mechanisms, structure/energy relationships and their interaction with reactive environmental species including light. *(Spring) (Alternate years)*

Graduate Only
CHEM 6060. Special Topics and Investigations. (1-3G) Prerequisite: consent of the instructor. Directed study of topics of current chemical interest. May be repeated for credit. *(On demand)*

CHEM 6115. Advanced Analytical Chemistry. (3G) Prerequisite: CHEM 4111 with a grade of *C* or better, satisfactory score on a chemistry proficiency exam, or consent of the instructor. The application of modern analytical methods to chemical problems. Emphasis is upon the chemical information, particularly structural, obtainable from these techniques. *(On demand)*

CHEM 6125. Theoretical Inorganic Chemistry. (3G) Prerequisite: CHEM 4121 with a grade of *C* or better, satisfactory score on a chemistry proficiency exam, or consent of the instructor. Group theoretical treatment of current theories of inorganic chemistry. Topics covered: Ligand field theory, molecular orbital theory for complex ions, electronic spectra of complex ions and the magnetic properties of complex ions. *(On demand)*

CHEM 6135. Advanced Organic Chemistry. (3G) Prerequisite: CHEM 4133 and either 4134 or 4135 with a grade of *C* or better, satisfactory score on a chemistry proficiency exam, or consent of the instructor. A qualitative discussion of modern mechanistic interpretation of the relations between structure and reactivity. Special emphasis is placed on the role of reactive intermediates such as carbonium ions, carbanions, carbines and radicals. (*On demand*)

CHEM 6138. Stereochemistry. (3G) Prerequisite: Advanced course in Biochemistry or Organic Chemistry. Three-dimensional chemistry and its chemical, physical and biochemical consequences, emphasizing classification of isomers and stereoisomers and the consequences of molecular shape on chemical and biological properties. *(Spring) (Alternate years)*

CHEM 6145. Chemical Thermodynamics. (3G) Prerequisite: CHEM 3142 with a grade of *C* or better, satisfactory score on a chemistry proficiency exam, or consent of the instructor. The postulatory basis of classical thermodynamics. Problems in chemical thermodynamics. The use of statistical mechanics for calculating thermodynamic functions. *(On demand)*

CHEM 6146. Rates and Mechanisms. (3G) Prerequisite: CHEM 3142 with a grade of *C* or better, satisfactory score on a chemistry proficiency exam, or consent of the instructor. Consideration of chemical kinetics and mechanism schemes, particularly those of current interest. *(On demand)*

CHEM 6150. Seminar-Internship. (1-3G) Prerequisite: consent of the instructor. Required for all teaching assistants. Supervised experience in the teaching of college chemistry. Graded *Pass/No Credit*. May be repeated for credit. *(Fall, Spring)*

CHEM 6681. Research Seminar. (1G) Prerequisite: consent of the instructor. Discussion of recent developments and special topics in chemistry. Graded *Pass/No Credit*. *(Fall, Spring)*

CHEM 6682. Research Seminar. (1G) Prerequisite: consent of the instructor. Individual investigation and exposition of the results. May be repeated for credit. *(Fall, Spring)*

CHEM 6900. Research and Thesis. (1-16G) Prerequisite: consent of the instructor overseeing thesis research. Laboratory research for the thesis. (*Fall, Spring, Summer*)

CHEM 7999. Graduate Residence. (0G) Prerequisite: consent of the instructor overseeing thesis research. Required of all master's degree students who are working on a thesis but not enrolled in other graduate courses. (Fall, Spring)

CHILD AND FAMILY DEVELOPMENT (CHFD)

Undergraduate
CHFD 2111. Child Study: Interpreting Children's Behavior. (3) Growth of individuals and the forces which influence this growth. Current theories of child development with emphasis on the complex interaction between heredity and environmental factors. (*Fall*)

CHFD 2113. Infant and Early Years. (3) Examination of development from its beginnings to early childhood with emphasis on theories, research and other data relative to infancy and the early years and implications for curriculum design. *(Fall, Summer)*

CHFD 2114. Foundations of Preschool Education. (3) Strategies for program analysis, design, implementation, and evaluation of programs for infants and young children. *(Fall)*

CHFD 2115. Education of the Young Child. (3) Developmental needs of children as related to group care

situations, curriculum decisions, and the design of early learning environments. Emphasis on current issues, the role of the caregiver (parent and/or teacher), and the process of guiding and teaching young children. (Designed to complement Practicum II.) *(Spring, Summer)*

CHFD 2412. Practicum I: Observing and Recording Children's Behavior. (2) Investigates the purposes and methods of observation of young children. Content includes observational activities, actual and simulated, individual and group. Students will observe, record, and analyze children's physical-motor, social, emotional, moral and cognitive development using developmental theory. (Designed as the Field Study for CHFD 2111.) *(Fall)*

CHFD 2416. Practicum II: The Child and the Community. (2) A supervised practicum with placements in settings depicting care and educational learning experiences for children. Emphasis on program components, the evaluation and development of materials and practices for care and education. Students spend three half-days per week in placement. (Designed as the Field Study for CHFD 2115.) *(Spring)*

CHFD 3113. Parent Education. (3) An emphasis on communication, home-school partnerships, family dynamics, and the community/school relationship. *(Spring)*

CHFD 3115. Learning and Development. (3) Examination of the relationship of learning and development with emphasis on conceptualizing child development and interpreting data related to growth and development. Specific attention to the affective, cognitive and psychomotor domains and theories as seen in a multicultural context. *(Fall, Spring, Summer)*

CHFD 3410. Student Teaching/Seminar: B-K Child and Family Development. (15) Prerequisites: Approval of an Application for Student Teaching. Planned sequence of experiences in the student's area of specialization conducted in an approved setting under the supervision and coordination of a university supervisor and a cooperating teacher. Student must demonstrate the competencies identified for the B-K teaching field. Approximately 35-40 hours per week in an assigned school setting and 10-12 on-campus seminars scheduled throughout the semester. *(Spring)*

CHFD 3412. Practicum III: The Family and the Community. (2) Explores the nature of the family as a living, dynamic system within the larger system of society. Seeks to integrate current theories of family interaction, emerging family roles, and alternative patterns of family adjustment with practice in community settings. Students work in settings impacting on family life. *(Fall)*

CHFD 3416. Internship in Child and Family Development. (12) Intensive work with children and families in the field planned by student and adviser with focus on integration of theory and practice. *(Spring)*

CHFD 3619. Senior Seminar in Child and Family Development. (3) A synthesizing course of study focusing on review, compilation, analysis and evaluation of the literature, research and experiences relevant to the student's area of focus. Students will present a plan of action/study for approval prior to registration for this semester. *(Spring)*

CHFD 3800. Individual Study in Child and Family Development. (1-6) Prerequisite: Permission of the student's adviser. Independent study under the supervision of an appropriate faculty member. May be repeated for credit. *(Fall, Spring, Summer)*

Graduate and Advanced Undergraduate
CHFD 5000. Topics in Child and Family Development. (1-6) (1-6G) May include classroom and/or clinical experiences in the content area. With department approval, may be repeated for credit for different topics. *(Fall, Spring, Summer)*

Graduate Only
CHFD 6000. Topics in Child and Family Development. (1-6G) May include classroom and/or clinic experiences in the content area. With department approval, may be repeated for credit for different topics. *(Fall, Spring, Summer)*

CHFD 6100. Adjustment Problems, Children and Youth. (3G) Study of adjustment problems of childhood and adolescence with emphasis on theoretical postulates as they relate to problems of behavior and attitudes in educational environments. *(On demand)*

CHFD 6102. Learning and Development. (3G) In-depth study of selected theories of learning and development. *(Fall, Spring, Summer) (Evenings)*

CHFD 6110. Parent Education. (3G) Study of principles and practices for research, development of programs and evaluation in parent education. *(On demand) (Evenings)*

CHFD 6115. Strategies and Designs in Human Development and Learning Child Advocacy. (3G) Study of principles and practices for educational personnel to employ as child advocates. *(On demand) (Evenings)*

CHFD 6120. Creativity, Learning Environments and Experiences. (3G) Investigation of theories of creativity and their relationship to curriculum development. *(Spring, Summer) (Evenings)*

CHFD 6130. Concepts of Teaching and Learning: Children's Play. (3G) Examination of theories, trends and current practices in children's play. *(On demand)*

Advanced Graduate Only
CHFD 7135. Readings in Learning and Development. (3G) Examines research data about the development of human behavior interpreted in terms of multiple disciplines, including psychology, anthropology and ethnology. *(On demand)*

CIVIL ENGINEERING TECHNOLOGY (CIET)
See Engineering Technology

CRIMINAL JUSTICE (CJUS)

Undergraduate
CJUS 1100 Introduction to Criminal Justice. (C) (3) Components of the criminal justice system are reviewed and

their interrelatedness assessed; law enforcement, corrections and courts discussed; studies of the functions of the system reviewed. (*Fall, Spring, Summer*)

CJUS 2000. Introduction to Law Enforcement. (3) Critical examination of policing in terms of the past and present structures, methods, ethics, legal framework and operations typical of contemporary American law enforcement agencies. *(Fall, Spring, Summer)*

CJUS 2102. Ethics and the Criminal Justice System. (V) (3) The study of applied and professional ethics and ethical issues in the administration of justice. (*Fall, Spring*)

CJUS 2120. Juvenile Justice. (3) Intensive analysis of the administration of juvenile justice within the United States. Particular emphasis on decision making and procedures of police, courts, and correctional agencies for juveniles. (*Fall, Spring*)

CJUS 2154. Introduction to Corrections. (3) An overview of community and institutional corrections in the U.S. such as jails, probation, alternatives to incarceration, correctional institutions, treatment strategies and parole. *(Yearly)*

CJUS 3000. Topics in Criminal Justice. (3) Prerequisite: CJUS 1100. Specialized criminal justice topics. May be repeated for credit. *(On demand)*

CJUS 3100. Criminal Justice Theory. (3) Theory construction methods; tests of theories; criminological and criminal justice system theory. (*Fall, Spring*)

CJUS 3101. Research Methods in Criminal Justice. (4) Prerequisite: junior standing and STAT 1222. Research designs, data collection and data analysis relevant to criminal justice. (*Fall, Spring*)

CJUS 3102. American Criminal Courts. (3) Prerequisite: CJUS 1100. Analysis of the court component of criminal justice with emphasis on social science literature concerning prosecutors, defense attorneys, judges, juries and court reform policies. (*Fall, Spring*)

CJUS 3110. Criminal Justice and the Law. (3) Nature and development of criminal law including the concepts of criminal liability, responsibility, and capacity; comprehensive analysis of the various crimes against persons, property and morality. (*Fall, Spring*)

CJUS 3111. Criminal Procedure. (3) Examines the rules that govern everyday operation of the criminal justice system from investigation to appeal. *(Yearly)*

CJUS 3120. The Juvenile Offender. (3) Measurement of juvenile delinquency, explanations of delinquent behavior and policies intended to both prevent and respond to delinquent behavior. *(Yearly)*

CJUS 3121. Juvenile Law. (3) Statutory and case law relating to juveniles with special emphasis on the North Carolina Juvenile Code. (*Fall, Spring*)

CJUS 3130. The Administration of Criminal Justice. (W)(3) Examines major organizational theories and administrative functions with direct application to criminal justice agencies. *(Yearly)*

CJUS 3141. Law Enforcement Behavioral Systems. (3) Current issues in law enforcement. Specific topics include: community relations, stress, the use of force, and the effect of culture on law enforcement. (*Spring*)

CJUS 3150. Community Corrections. (3) Structure, functions and effectiveness of community corrections. Emphasis on the deinstitutionalization movement, community-based treatment centers, community service agencies, work release programs and current trends in community corrections. (*Fall*)

CJUS 3151. Institutional Corrections. (3) Structure, functions and effectiveness of correctional institutions. Emphasis is on the history of corrections, classification of offenders, institutionalization, treatment programs, juvenile training schools and the future of corrections. (*Fall*)

CJUS 3152. Correctional Law. (3) Development, substance and operationalization of the law of corrections.(*Alternate years*)

CJUS 3153. Juvenile Corrections. (3) Examination of community-based and institutional correctional programs for juveniles and analysis of the effectiveness of these programs. *(On demand)*

CJUS 3160. Victims and the Criminal Justice System. (3) Relationship between victims of crime and the criminal justice system. Specific topics include an analysis of the characteristics of crime victims, victim reporting and nonreporting patterns, treatment of victims by the various segments of the criminal justice system, victim assistance programs and the issue of compensation and/or restitution for victims of crime. (*Spring, Fall*)

CJUS 3200. Security and Loss Prevention. (3) Overview of the field of private security and loss prevention with emphasis on current legislation, loss prevention, risk management and security countermeasures. (*Yearly*)

CJUS 3210. Problems and Decisions in Criminal Justice. (W) (3) Prerequisites: Junior standing and consent of the department. Evaluation of criminal justice policy and decision-making. (*Fall, Spring*)

CJUS 3220. The Criminal Offender. (3) Examines the research, theory, and practice of criminal behavior focusing primarily on interaction of the offender with social-environmental factors. *(Yearly)*

CJUS 3400. Criminal Justice Practicum. (1-6) Prerequisite: CJUS 1100 and consent of the department and criminal justice agency. Supervised experience in a criminal justice agency. May be repeated for credit up to a maximum of 12 hours but with no more than six hours counting toward the major. *(Fall, Spring)*

CJUS 3800. Directed Individual Study. (1-4) Prerequisite: junior standing and consent of the department. Special problems. May be repeated for credit. (*Fall, Spring*)

Undergraduate/Available for Graduate Credit

Additional work required for graduate credit.

CJUS 4000. Topics in Criminal Justice. (1-6) (1-6G) Prerequisite: consent of the department. Specialized criminal justice topics. May be repeated for credit. (Pass/no credit grading when taught as "Movies and the Portrayal of Crime and Justice.") (*Fall, Spring*)

CJUS 4101. Drugs, Crime and the Criminal Justice System. (3) (3G) Use of drugs and their relationship to crime including the impact of drugs on the individual and the criminal justice system. (*Fall, Spring*)

CJUS 4103. International Criminal Justice. (3) (3G) Prerequisite: junior standing. Examination of the criminal justice systems of the United States and other nations. (*Spring*)

CJUS 4161. Violence and the Violent Offender. (3) (3G) Issues surrounding violence in today's society and their impact on offenders involved in homicide, child and domestic abuse, and other forms of violence. Examination of myths about violence, victim-offender characteristics and relationships, and theories of violence. *(On demand)*

Graduate and Advanced Undergraduate

CJUS 5103. Program Planning and Evaluation in Criminal Justice. (3) (3G) Prerequisite: junior standing and consent of the department. Applied research as the foundation for criminal justice planning; distinctions between basic and applied research. Emphasis on the theoretical bases of planning in general and on criminal justice planning in particular. Evaluation as it relates to criminal justice programs to assist the student in predicting the success or failure of a project or program. (*Alternate years*)

CJUS 5131. Police Problems and Practices. (3) (3G) Prerequisite: junior standing and consent of the department. Role and function of police on the operational level. Discretionary decision making and the legal, social and institutional contexts in which it occurs. Police problems and practices are examined in the context of interpersonal and intrapersonal theories. (*Alternate years*)

Graduate Only

CJUS 6000. Topics in Criminal Justice. (3-6G) Special issues; may be repeated for credit. (*Alternate years*)

CJUS 6100. The Criminal Justice System. (3G) Major subsystems of the criminal justice system including law enforcement, criminal courts, correctional agencies, and the juvenile offender subsystem. Linkage of these subsystems to each other and to the community and society at large. *(Fall)*

CJUS 6101. The Nature and Theory of Crime. (3G) Definitions and patterns of criminal behavior. Major theoretical perspectives on crime, including historical, philosophical, individual, community-oriented and societal approaches. *(Fall)*

CJUS 6102. Research in Criminal Justice. (3G) Research methodology and statistics with emphasis on applications to criminal justice settings. *(Spring)*

CJUS 6104. Criminal Justice and Social Control. (3G) Ethical issues of social control and criminal and civil law responses to such issues. Examination and critiques of assumptions underlying systems of social control, especially as they relate to the application of sanctions and treatment to such issues as mental illness and drug addiction and alcoholism. *(Spring)*

CJUS 6120. Criminal Justice Management and Decision-Making. (3G) Application of generic principles of management and supervision to operational problems confronted by criminal justice agencies with particular attention to decision- making and discretion in criminal justice settings. *(Fall)*

CJUS 6130. Law Enforcement Systems. (3G) Consideration of the elements of law enforcement agencies as subsystems of the total criminal justice system. Attention is given to the relationship between the law enforcement subsystems and the community. (*Alternate years*)

CJUS 6132. Legal Issues in Law Enforcement. (3G) Law applicable to the functions of police administrators and line police officers including constitutional, statutory, judicial, and administrative law governing search and seizure, arrest, interrogation, use of force, jurisdiction, civil and criminal liability of administrators and officers, and the rights of officers and suspects. *(Fall)*

CJUS 6140. Prosecution and Adjudication Processes. (3G) Functions and powers of prosecutors, defense attorneys, judges and juries including plea bargaining and court procedure. (*Alternate years*)

CJUS 6150. Corrections. (3G) Functions of correctional agencies, principles of punishment and a historical analysis of correctional institutions and programs including prisons, jails, probation and parole systems. (*Alternate years)*

CJUS 6151. Correctional Strategies: Rehabilitation and Reintegration. (3G) Efforts to change offender behavior and to facilitate the development of offender- community linkages. Institutional classification and treatment strategies, pre-release and temporary release programs, innovative uses of probation and parole systems, community residential programs and new dispositional models; e.g., sentencing to community service and restitution. (*Alternate years)*

CJUS 6152. Legal Issues in Corrections. (3G) Major legal issues pertaining to corrections, including sentencing, probation, restitution, prisons, parole, pardon and restoration of rights with emphasis on legal issues often confronted by correctional administrators and probation and parole personnel. (*Alternate years)*

CJUS 6160. Juvenile Justice Systems. (3G) The process by which specific behaviors are identified as delinquent and the responses of the juvenile justice system to such behaviors. Laws dealing with the juvenile justice system, the historical development of the system, and the effectiveness of innovative responses to delinquency. (*Alternate years)*

CJUS 6800. Directed Individual Study in Criminal Justice. (3G) Supervised investigation of a criminal justice problem of special interest to the student. May be repeated one time with the approval of the student's major professor or academic committee. *(Fall, Spring)*

CJUS 6900. Thesis. (6G) Independent research of a significant criminal justice topic approved by the student's academic committee. *(Fall, Spring)*

COMMUNICATION STUDIES (COMM)

Undergraduate

COMM 1101. Introductory Speech. (3) For students who want to upgrade their oral communication skills. Opportunity to study theory and practice of public speaking. Special emphasis placed on constructing and delivering speeches. *(Fall, Spring, Summer) (Evenings)*

COMM 1107. Introduction to Communication Contexts. (3) A survey of the nature and practice of communication in interpersonal, small group, intercultural, organizational, public relations, and mass communication contexts. *(Spring)*

COMM 2100. Introduction to Communication Theory. (3) Introduces students to traditional and contemporary theories about human communication processes including the nature of theory building, and major theoretical developments within the field of communication. *(Fall)*

COMM 2101. Introduction to Rhetorical Theory. (3) Evolution of rhetorical theory from ancient to modern times and examination of major rhetorical theorists. Emphasis on using rhetorical theory to better understand contemporary persuasive messages. *(Fall, Spring)*

COMM 2102. Advanced Public Speaking. (3) Prerequisite: COMM 1101 or permission of the instructor. Advanced theory and practice of speaking in public. Research, composition, and delivery of various types of speeches and presentations. *(Spring)*

COMM 2103. Argumentation and Debate. (3) Introduction to the basic theory and skills of argumentation and debate. Assumptions of argumentation, evidence, reasoning, argument construction, cross- examination, refutation and ethics included. *(Fall)*

COMM 2105. Small Group Communication. (3) Principles of discussion and deliberation in small groups. Practice in organizing, leading and participating in various forms of group communication. Emphasis on problem solving and leadership skills. *(Fall, Spring, Summer)*

COMM 2107. Interpersonal Communication. (3) Study of the dynamics of one-to-one human communication. The relation of language to human communication, perception and reality, self-concept, nonverbal communication codes, development of trust and self-disclosure, and development of positive communication style. *(Fall, Spring)*

COMM 2491. WFAE Radio Practicum. (2-3) Prerequisites: COMM 1101 or equivalent and permission of station manager. On-the-air announcing, board operations, and production work at public radio station WFAE. Pass/No Credit grading only. No more than three hours of COMM 2491 may be used toward requirements for the minor. Credit only for work done while registered for the course. *(Fall, Spring, Summer)*

COMM 3050. Topics in Communication Studies. (3) Prerequisite: COMM 1101. Timely and important areas relevant to communication studies. May be repeated for credit with permission of the major adviser. *(On demand)*

COMM 3100. Communication Research Methods. (3) Prerequisites: COMM 2100 and STAT 1222. Methods for systematic investigation of communication behavior in all primary communication contexts including utilization of library materials and quantitative and qualitative techniques for data analysis. *(Fall, Spring)*

COMM 3101. Persuasion. (3) Emphasis on the theory and practice of persuasion. Topics include attitude modification, theories of persuasion, source credibility, persuasive strategies, ethics and audience analysis. *(Fall, Spring)*

COMM 3120. Communication and Mass Media. (3) A survey of the function and history of print and electronic media as forms of communication, their influence upon society, and the legal and economic environments in which they operate. *(Fall, Spring)*

COMM 3121. Mass Communication and Society. (3) Examines important issues involving mass communication. Critical study of the effect mass communication exacts on society. *(Spring)*

COMM 3130. Communication and Public Advocacy. (3) Examination of how symbols are used in public advocacy from both applied and theoretical perspectives with emphasis on rhetorical uses of language and non-verbal symbols in the creation and transmission of public messages. *(Fall, Spring)*

COMM 3131. African-American Oratory. (3) Oratory by African-Americans using in-depth study of speech texts and video and general rhetorical principles to examine historic as well as lesser known speeches. *(Spring)*

COMM 3141. Organizational Communication. (3) Examines the importance of the operation of communication processes within organizations and between organizations and their environments. *(Fall)*

COMM 3145. Communication and Public Relations. (3) Examines the role of communication in the field of public relations. Special emphasis given to the relationships between communication and the functions of public relations. *(Fall, Spring)*

COMM 3403. Debate Practicum. (2) Prerequisites: COMM 2103 or equivalent and permission of instructor. Application of debate principles and practices as a member of UNC Charlotte Debate Team. Research, argument construction and tournament competition required. Can be repeated four times. No more than four hours of COMM 3403 may be used toward requirements for the minor. *(Fall, Spring)*

COMM 3880. Independent Study. (1-3) Prerequisites: COMM 1101, permission of instructor and major adviser. Area of study beyond the scope of current offerings to be devised by student and faculty member. May be repeated. Three hours of COMM 3880 may be used toward the minor with prior approval of the departmental chairperson. *(Fall, Spring, Summer)*

Undergraduate/Available for Graduate Credit
COMM 4101. Media and the Law. (3) (3G) Prerequisite: At least junior standing or consent of instructor. Survey of legal rights, restrictions, and ethical considerations in field of communication including the First Amendment, libel, invasion of privacy, obscenity law, regulation of electronic media, relationships between media and judiciary. *(Fall, Spring)*

COMM 4102. Federal Interpretation of the First Amendment. (3) (3G) Prerequisite: At least junior standing or consent of instructor. In-depth case analysis of tests determining Constitutional boundaries of expression, including clear and present danger, prior restraints, fighting words/symbolic speech, strict scrutiny, obscenity, indecency. *(Fall, Spring)*

COMM 4141. Advanced Organizational Communication. (3) (3G) Prerequisite: COMM 3141. Critical examination of the communication practices of organizations which accomplish such tasks as establishing organizational identification influencing organizational members, and making decisions. Includes application of research methods to assess and analyze an organization's communication practices. *(Spring)*

COMM 4145. Public Relations Lab. (3) (3G) Prerequisites: COMM 3145. Lectures, workshops and guest speakers provide knowledge to enable students to research, design, implement, and complete public relations projects for community-based, not-for-profit organizations. The class is structured and run in a manner similar to a professional public relations agency with students assumingappropriate agency roles. May be repeated once. *(Fall, Spring)*

COMPUTER ENGINEERING (CPGR)

Undergraduate
CPGR 2181. Computer Logic and Design (3) Prerequisite: CSCI 1201 or consent of the department. Logic design; logic circuits; memories; tristate devices; bus structures; and data control concepts. *(Fall, Spring, Summer) (Evenings)*

CPGR 3182. Computer Organization and Architecture. (3) Prerequisite: CPGR 2181 or consent of the department. Machine level representation of data; von Neuman architecture; instruction sets and types; addressing types; assembly and machine language programming; control unit and microprogramming; alternate architectures. *(Fall, Spring, Summer) (Evening)*

CPGR 3183. Hardware System Design. (3) Prerequisite: CPGR 3182 or consent of the department. Design of hardwired control systems; processors and memory systems; application specific design; use of simulation tools. Laboratory intensive course. *(Spring) (Evenings)*

CPGR 3681. Senior Design I. (3) Prerequisites: senior standing, and at least two CPGR 3xxx/4xxx courses with a grade of *C* or better, or consent of the department. An individual or group computer engineering design project under the direction of a faculty member. Projects must be approved by the department before they can be initiated. *(Fall, Spring) (Evenings)*

CPGR 3682. Design II. (3) Prerequisites: CPGR 3681. A continuation of CPGR 3681. *(Fall, Spring) (Evenings)*

Undergraduate/Available for Graduate Credit

Additional work required for graduate credit.
CPGR 4181. Microcomputer Interfacing. (3) (3G) Prerequisite: CPGR 3182 or EEGR 3181 or CSCI 3141, or permission of the department. Signal conditioning, A/D conversion, noise, transmission line effects, signal processing, D/A conversion and serial/parallel interfaces. *(Fall, Alternate years) (Evenings)*

Graduate and Advanced Undergraduate
CPGR 508X. Topics in Computer Engineering. (3) (3G) Prerequisite: consent of the department. Collection of selected topics on current research and development in computer engineering which may vary from term to term. *(On demand)*

CPGR 5141. Computer Organization and Architecture. (3) (3G) Prerequisite: CPGR 3182 or equivalent. Fundamentals of computer design; instruction set design; basic processor implementation techniques; pipelining; memory hierarchy; Input/Output. Cost/performance and hardware/software tradeoffs. *(Fall, Spring) (Evenings)*

CPGR 5145. Parallel Computing. (3) (3G) Prerequisites: CSCI 1202 and CPGR 3182 or consent of department. Types of parallel computers, programming techniques for multiprocessor and multicomputer systems, parallel strategies, algorithms, and languages. *(Spring) (Alternate years)*

CPGR 5182. Computer Arithmetic. (3) (3G) Prerequisite: permission of the department. Principles, architecture, and design of fast two operand adders; multioperand adders, standard multipliers, and dividers. Cellular array multipliers and dividers. Floating point processes, BCD, and excess three adders, multipliers, and dividers. *(On demand)*

Graduate Only
CPGR 608X. Advanced Topics in Computer Engineering. (3G) Prerequisite: consent of the department. Collection of advanced topics on current research and development in computer engineering which may vary from term to term. *(On demand)*

CPGR 6134. Digital Image Processing. (3G) Prerequisite: CSCI 6114 or consent of the department. Cross-listed as EEGR 6118. Image perception; image types/applications; image restoration and enhancement; edge/boundary detection; image transformation; image segmentation; statistical and syntactical pattern recognition; image information measures and compression. *(On demand)*

CPGR 6181. Switching and Automata Theory. (3G) Prerequisite: consent of the department. Topics include sets, relations, lattices, Boolean algebras; functional decomposition and symmetric functions; threshold logic; multiple-valued logic; fault detection and fault tolerant design; finite state machines, incompletely specified machines, minimization; state identification and fault detection experiments; finite state recognizers. *(On demand)*

CPGR 6182. Advanced Computer Architecture. (3G) Prerequisite: CPGR 5141. Survey of existing and proposed architectures; pipelined, dataflow, restructurable, and supercomputer architectures. Multicomputer and multiprocessor architectures. Impact of VLSI on architecture. *(Spring) (Alternate years) (Evenings)*

CPGR 6184. Fault Tolerant Digital Systems. (3G) Prerequisite: CPGR 5141. Design and analysis of fault tolerant digital systems including design techniques, qualitative and quantitative methods of evaluation, and available fault tolerant digital systems. *(Fall) (Alternate years) (Evenings)*

CPGR 6186. Microelectronics System Design and Simulation. (3G) Prerequisite: CPGR 5141. Project oriented course on techniques and methodology in design and development of microelectronics systems including system specifications, hardware design of specific building blocks, simulation and iterative refinement of system boards, interface structure and data communication, interconnection architecture, printed circuit boards, and techniques for testing and debugging. *(Fall) (Alternate years) (Evenings)*

COMPUTER SCIENCE (CSCI)

Undergraduate

CSCI 1100. Algorithmic Languages I. (P) (3) Prerequisite: MATH 1100, 1101 or 1103 with a grade of *C* or better, or placement by the department. Basic concepts and terminology of computers, problem solving with computers, programming techniques required to formulate and program various numerical and non-numerical algorithms, through study of higher-level programming languages, such as PASCAL (CSCI 1100P) or FORTRAN (CSCI 1100). Computer Science majors may not receive credit for CSCI 1100. *(On demand)*

CSCI 1101. Introduction to Computer Concepts. (3) Prerequisite or corequisite: MATH 1100, 1101, or 1103. Introductory course for non-CSCI majors that covers various aspects of computer hardware and software, and surveys the application of computers in different fields--business, medicine, engineering, government, education. PC-software (word processing, spreadsheets, and databases) is introduced by several projects/assignments. (This course is not the equivalent of CSCI 1100 as a prerequisite for other computer science courses.) May not be taken while a computer science major (or minor). *(Fall, Spring, Summer) (Evenings)*

CSCI 1201. Introduction to Computing I. (P) (2) Prerequisites: MATH 1100, 1101, or 1103 with a grade of C or better, or consent of the department. Corequisite: CSCI 1201L. Basic concepts and terminology of computers; introduction to algorithmic problem solving strategies; basic data structures; data and procedural abstraction; and numerical and symbolic computing. *(Fall, Spring, Summer)(Evenings)*

CSCI 1201L. Computer Lab I (P) (1) Corequisite: CSCI 1201. Laboratory exercises dealing with program mechanics; algorithm development; and the use of computers in problem solving. One laboratory period of two hours per week. *(Fall, Spring, Summer)(Evenings)*

CSCI 1202. Introduction to Computing II. (2) Prerequisite: CSCI 1201 with a grade of C or better or consent of the department. Corequisite: CSCI 1202L. Extension of topics introduced in CSCI 1201 with studies of algorithm complexity; searching and sorting tech-niques; dynamic data structures; software development methodologies; and the computer science profession. *(Fall, Spring, Summer) (Evenings)*

CSCI 1202L. Computer Lab II (1) Prerequisite: CSCI 1201L. Corequisite: CSCI 1202. Laboratory exercises dealing with complexity; analysis of algorithms; software development; and dynamic data structures. One laboratory period of two hours per week. *(Fall, Spring, Summer) (Evenings)*

CSCI 1203L. Computer LabII (for MIS). (1) Prerequisite: CSCI 1201L. Corequisite: CSCI 1202. Laboratory exercises dealing with complexity; analysis of algorithms; software development; and dynamic data structures. One laboratory period two hours per week. *(Fall, Spring, Summer) (Evenings)*

CSCI 2050. Topics in Computer Science. (1-3) Prerequisite: consent of the department. Topics in computer science selected to supplement the regular course offerings at the 2000 level. (May be repeated for credit with the consent of the department.) *(On demand)*

CSCI 2111. Beginning Structured COBOL. (3) Prerequisite: CSCI 1201 or INFO 2130 with a grade of *C* or better, or consent of the department. A study of COBOL and its use in file manipulations, including structures, sorting, blocks, accessing of files, and transaction processing. Uses of file systems will be studied. *(Fall, Spring, Summer) (Evenings)*

CSCI 2112. Advanced Structured COBOL. (3) Prerequisites: CSCI 2111 or consent of the department. A continuation of the study of COBOL and its use in developing application programs and systems of programs. Emphasis on the development of programs to run in the interactive environment or batch programs in support of on-line processing. *(Fall, Spring, Summer) (Evenings)*

CSCI 2116. C Programming. (3) Prerequisite: CSCI 1201 with a grade of *C* or better or consent of the department. A study of the programming language C. Data types, operators, functions, program structure and storage classes, exceptions, concurrent programming, preprocessor. *(On demand)*

CSCI 2123. Introduction to Numerical Methods. (3) Prerequisites: CSCI 1201 and MATH 1142. General

concepts of scientific computing and their applications to such areas as non-linear equations, numerical integration, spline and polynomial interpolation, and initial value problems. *(Fall, Summer)(Evenings)*

CSCI 2140. Assembly Language, Machines, Systems. (3) Prerequisite: CSCI 1201 with a grade of *C* or better. General principles of assembly languages and assembly language programming. Computer structure, addressing techniques, internal representations, assembly systems. *(On demand)*

CSCI 2141. Introduction to Systems Programming. (3) Prerequisite: CSCI 2140 with a grade of *C* or better. Advanced assembly language concepts, use and management of macro and subroutine libraries, debugging techniques, program segmentation, parameter passing, file access and control programming, device drivers and interrupt handlers, reentrant coding, coroutines. *(On demand)*

CSCI 2161. Data Structures. (3) Prerequisites: CSCI 1201 with a grade of *C* or better, and knowledge of two higher-level languages. Stacks, queues, arrays, strings, lists, trees, and graphs. Applications to recursion, garbage collection, storage compaction, tree traversals, accessing of information, design and analysis of algorithms. *(On demand)*

CSCI 2163. Introduction to File Processing. (3) Prerequisites: knowledge of a high-level language which supports random access file methods and CSCI 1202. Concepts and techniques of structuring data on external storage devices; and to provide the foundation for applications of data structures and file processing techniques. *(Fall, Summer) (Evenings)*

CSCI 2170. Information Storage and Retrieval. (3) Prerequisite: CSCI 1202. Introduction to the concepts, principles, and skills of information science including tools for the analysis, design, implementation, and evaluation of information systems and information storage. *(Spring, Summer)(Evenings)*

CSCI 2175. Logic and Algorithms. (3) Prerequisites: CSCI 1201 and MATH 1242. Introduction to propositional calculus; predicate calculus; algorithms; logic functions; finite-state machines; logic design. *(Spring, Summer) (Evenings)*

CSCI 2215. Design and Analysis of Algorithms. (3) Prerequisite: CSCI 1202 with a grade of C or better, and Math 1165. Techniques and tools for the development of correct algorithms. Structured and modular programming efficiency and correctness, testing recusing, complexity, and heuristics. *(Fall, Spring, Summer, Evenings)*

CSCI 3050. Topics in Computer Science. (1-3) Prerequisite: consent of the department. Topics in computer science at the upper-division level. May be repeated for credit as topics vary with the consent of the department. *(On demand)*

CSCI 3102. Programming Languages. (3) Prerequisite: CSCI 1202. Formal definition of programming languages including specification of syntax and semantics. Evolution of programming languages and language design principles. Structural organization, control structures, data structures and types, name visibility, binding times, parameter passing modes, subroutines, coroutines, and tasks. Functional programming, list processing, logic programming, object-oriented programming systems. *(Fall, Spring, Summer)(Evenings)*

CSCI 3106. Structured Systems Analysis and Design. (3) Prerequisite: CSCI 1202 or consent of the department. Structured systems development. Strategies and techniques of structured analysis and structured design to produce logical methodologies for dealing with complexity in the development of information systems. *(Fall, Spring, Summer) (Evenings)*

CSCI 3110. Compiler Construction. (3) Prerequisites: CSCI 1202 and 3102. Review of programming language structures, translation, loading, execution, and storage allocation. Compilation of simple expressions and statements. Organization of a compiler, including compile-time and run-time tables, lexical scan, syntax scan, object code generation, error diagnostics, object code optimization techniques, and overall design. Use of compiler writing languages and boot strapping. *(Spring, Alternate years)(Evenings)*

CSCI 3112. Design and implementation of Object-oriented Systems. (3) Prerequisite: CSCI 2215 or consent of the department. Introduction to the basic paradigm of object-oriented programming and system development. Topics include: evolution of object-oriented methodology; concept of the object-oriented approach; object-oriented programming languages; object-oriented analysis and design; the design of software for reuse; and incremental software development. *(Spring)(Evenings)*

CSCI 3120. Introduction to Computer Graphics. (3) Prerequisites: CSCI 1202 and MATH 2164 or consent of department. Graphics hardware; raster algorithms; geometric transformations; 2D/3D interactive graphics; 3D viewing and perspective projections; color and lighting models; hidden surface removal; modeling hierarchies; fractals; curved surfaces. *(Spring) (Evenings)*

CSCI 3130. Human-Computer Interaction. (3) Prerequisite: CSCI 2163 or 2170. Concepts of the design of the human-machine environment, with special emphasis on human-computer interaction and how people acquire, store, and use data from the environment and from computers. Topics include: analysis, creation and improvement of equipment and environment to make them compatible with human capabilities and expectation; analysis of existing equipment with respect to user usability and interfacing capabilities. *(Fall, Alternate years) (Evenings)*

CSCI 3131. Human and Computer Information Processing. (3) Prerequisite: CSCI 2163 or 2170. Overview of methods people use to acquire, store, and use the data they receive from the environment and their implementation of computers. Topics include: perception, pattern recognition, attention, memory, knowledge representation, language, and problem solving. *(On demand)*

CSCI 3132. Information Systems. (3) Prerequisite: CSCI 2163 or 2170. Analysis, design, implementation, and evaluation of information systems. Topics include: techniques of manipulating data; behavioral component of dealing with the user and integration of technology, procedures, and people. *(On demand)*

CSCI 3134. Digital Image Processing. (3) Prerequisites: CSCI 1202, MATH 1242 and 2164, with grades of C or better. Overview of fundamentals of image acquisition, representation, enhancement, segmentation, reconstruction, analysis and recognition. Image generation, viewing and perception; image transformations using the Fourier transform; spatial operations and filtering (spatial and frequency domain); image coding; lossless and lossy compression; boundary and region based segmentation; thresholding and classification; boundary and regional image descriptors; matching and neural networks; shape numbers. *(Fall) (Evenings)*

CSCI 3141. Computer Organization. (3) Prerequisite: CSCI 2140 with a grade of *C* or better, or consent of the department. Basic digital components, data representations, machine control flow, accessing, transfer and I/O functions. Introduction to multilevel machines, micro programming concepts, survey of various computer architectures. *(On demand)*

CSCI 3143. Operating Systems. (3) Prerequisite: CSCI 3141 or CPGR 3182. Introduction to multiprogramming operating systems. Process synchronization and management of memory, devices, and files; performance evaluation. *(Fall, Spring) (Evenings)*

CSCI 3152. Symbolic Programming. (3) Prerequisite: CSCI 1202. Basic concepts of symbolic programming including selected topics in artificial intelligence, heuristic searching, symbolic algebra, language parsing, and theorem proving. *(Fall) (Evenings)*

CSCI 3153. Introduction to Artificial Intelligence. (3) Prerequisite: CSCI 3152. Basic concepts of artificial intelligence. Topics include: defining the problem as a state space search, production systems; heuristic search; basic problem-solving methods; game playing; knowledge representation using predicate logic, semantic nets, frames, and scripts; non-monotonic reasoning, statistical and probabilistic reasoning. *(Spring) (Evenings)*

CSCI 3155. Software Engineering. (3) Prerequisite: CSCI 2215 or consent of the department. The system development cycle is examined in detail from the aspects of software engineering. Current tools and techniques of systems design-data dictionary, data flow diagrams, structured walkthroughs, and capacity planning will be taught and presented in conjunction with case studies and class problems. *(Fall, Spring) (Evenings)*

CSCI 3160. Data Base Design and Implementation. (3) Prerequisite: CSCI 1202 with a grade of *C* or better. Logical and physical database organization, data models, design issues, and secondary storage considerations. Emphasis on actual participation in the design and implementation of databases. *(Fall, Spring) (Evenings)*

CSCI 3166. Distributed Computer Information Systems. (3) Prerequisite: knowledge of a high level language which supports random access file methods or consent of the department. Distributed vs. centralized processing. Data communications; speed; capacity, media, protocols. Network architectures. Distribution of data, computer power, and support. Evaluation of alternatives. Case studies. *(Fall, Spring, Summer) (Evenings)*

CSCI 3650. Senior Project. (3) Prerequisites: senior standing, and two CSCI 31xx/41xx courses with a grade of *C* or better, or consent of the department. An individual or group project in the teaching, theory, or application of computer science under the direction of a faculty member. Projects must be approved by the department before they can be initiated. *(Fall, Spring) (Evenings)*

CSCI 3651. Senior Project. (3) Prerequisite: CSCI 3650. A continuation of CSCI 3650. *(Fall, Spring) (Evenings)*

CSCI 3688. Computers and Their Impact on Society. (VW) (3) Prerequisites: Junior standing and consent of the department. A study of current topics (software piracy, hacking, professional conduct) in computer science and the impact of computers on various subsets (home, government, education) of society. *(Fall, Spring, Summer) (Evenings)*

CSCI 3690. Seminar. (1-6) Prerequisite: consent of the department. May be repeated for credit. *(On demand)*

CSCI 3691. Seminar. (1-6) Prerequisite: consent of the department. A continuation of CSCI 3690. May be repeated for credit. *(On demand)*

CSCI 3695. Computer Science Cooperative Education Seminar. (1) Required of Co-op students during semester immediately following each work assignment for presentation of reports on work done the prior semester. May be repeated for credit. *(Fall, Spring, Summer)*

CSCI 3699. Senior Seminar. (1-3) Prerequisites: Senior standing and consent of the department. Each participant will prepare a lecture on a topic in computer science. Emphasis will be on communication of technical information as well as on content of the presentations. May be repeated for credit. *(On demand)*

Undergraduate/Available for Graduate Credit

Additional work required for graduate credit.

CSCI 40XX. Topics in Computer Science. (3) (3G) *(On demand)*

CSCI 4170. Project Management. (3)(3G) Prerequisite: CSCI 2215, 3155, or consent of department. Classical and matrix organization techniques for project management. The system development cycle. Project control: major documents and milestones; phases, functions, and key documents. Impact of project size and project subject on techniques and procedures. *(Spring) (Alternate years) (Evenings)*

Graduate and Advanced Undergraduate

CSCI 50XX. Topics in Computer Science. (3) (3G) *(On demand)*

CSCI 5102. Survey of Programming Languages. (3) (3G) Prerequisite: consent of the department. Study of the concepts underlying various computer languages and comparing and evaluating various language features. History and development of various languages, such as FORTRAN, ALGOL, PASCAL, MODULA-2, C, C++, Ada, Lisp, Smalltalk, Prolog...; evaluation and comparison of various algorithms and language suitability. Selection of languages for problems/ environments. Overview of various languages. *(Fall) (Spring) (Evenings)*

CSCI 5110. Programming Languages and Compilers. (3) (3G) Prerequisite: consent of the department. Introduction to the concepts and techniques used in describing, defining, and implementing programming languages and their compilers. Introduction to parsing and parser construction; LL and LR grammars; syntax directed translation; data object representations; run time structures; intermediate languages; code optimization. *(Spring) (Alternate years) (Evenings)*

CSCI 5112. Software System Design and Implementation. (3) (3G) Prerequisite: consent of the department. Introduction to the techniques involved in the planning and implementation of large software systems. Emphasis on human interface aspects of systems. Planning software projects; software design process; top-down design; modular and structured design; management of software projects; testing of software; software documentation; choosing a language for software system. *(Fall) (Spring) (Evenings)*

CSCI 5130. Computer Graphics. (3) (3G) Prerequisite: CSCI 1202 or equivalent and MATH 2164 or equivalent. Introduction to the design and implementation of interactive graphics systems. Raster and vector display systems, I/O devices; graphics primitives and their attributes; raster algorithms and clipping; 2D/3D geometric transformations; 3D viewing and projections; hierarchical and procedural models; surface representation; color and lighting models; rendering algorithms; global illumination and texture mapping. *(Fall) (Alternate years) (Evenings)*

CSCI 5131. Simulation. (3) (3G) Prerequisites: CSCI 1201 and its lab, and MATH 3122, or consent of department. Emphasis on the design and derivation of mathematical models of dynamic systems; deterministic simulation; random events; non-deterministic simulation; discrete simulation; comparison and optimization. *(On demand)*

CSCI 5150. Artificial Intelligence. (3) (3G) Prerequisites: CSCI 2175 and 1202 or consent of department. To introduce core ideas in AI. Heuristic versus algorithmic methods; problem solving; game playing and decision making; automatic theorem proving; pattern recognition; adaptive learning; projects to illustrate theoretical concepts. *(Fall) (Alternate years) (Evenings)*

CSCI 5151. Intelligent Robotics. (3) (3G) Prerequisites: CSCI 1202 and MATH 2164, or consent of the department. General introduction to spatial descriptions and transformations, and manipulator position and motion. More study on robot planning, programming, sensing, vision, and CAD/CAM. *(Fall) (Alternate years) (Evenings)*

CSCI 5152. Computer Vision. (3) (3G) Prerequisites: CSCI 1202 and MATH 2164, or consent of the department. General introduction to computer vision and its application. Topics include low level vision, 2D and 3D segmentation, 2D description, 2D recognition, 3D description and model-based recognition, and interpretation. *(Fall) (Alternate years) (Evenings)*

CSCI 5156. Computer-Aided Instruction. (3) (3G) Prerequisite: consent of the department. History of CAI; study of current CAI systems; development of man-machine dialogue; programming tools for CAI; information structures for computer-oriented learning. Advantages/disadvantages/costs of CAI. *(On demand)*

CSCI 5165. Coding and Information Theory. (3) (3G) Prerequisite: knowledge of probability theory. Information theory; coding theory; Shannon's theorem; Markov process; channel capacity; data transmission codes; error correcting codes; data compression; data encryption. *(On demand)*

CSCI 5170. Formal Languages and Automata. (3) (3G) Prerequisites: one semester of discrete structures or consent of the department. Detailed study of abstract models for the syntax of programming languages and information processing devices. Languages and their representation; grammars; finite automata and regular sets; context-free grammars and pushdown automata; Chomsky Hierarchy; closure properties of families of languages; syntax analysis. *(On demand)*

CSCI 5171. Logic Programming. (3) (3G) Prerequisite: CSCI 2175 or consent of the department. Prolog programming language; programming techniques in Prolog; foundations of logic programming including computability of Horn clause logic, completeness of resolution principle, complexity of unification algorithms, and verification of logic programs; principles of implementing logic programming systems; selected topics from applications of logic programming to expert systems, intelligent database systems, and/or natural language processing. *(On demand)*

Graduate Only

CSCI 60XX. Topics in Computer Science. (3G) Prerequisite: consent of department. Exposure to current research and literature. Detailed exploration of main theme or a collection of related topics which may vary from term to term. *(On demand)*

CSCI 605X. Advanced Topics in Artificial Intelligence. (3G) Prerequisite: CSCI 5150 or consent of the department. A selected topic in artificial intelligence, such as machine learning, computer vision, heuristic search, natural language processing. (May be repeated for credit as topics vary and with the approval of the department.) *(On demand)*

CSCI 6110. Advanced Topics in Programming Languages and Compilers. (3G) A continuation of material in CSCI 5110 with emphasis on advanced aspects of optimization, data flow analysis, and error discovery. *(On demand)*

CSCI 6111. Evolutionary Computation. (3G) Prerequisite: CSCI 6114 or consent of the department. General introduction to optimization problems. Optimization

techniques: hill climbing, simulated annealing, evolution strategies, genetic algorithms. Evolution programming techniques. *(Spring) (Alternate years)* (*Evenings*)

CSCI 6114. Algorithms and Data Structures. (3G) Prerequisite: full graduate standing. Introduction to techniques and structures used and useful in design of sophisticated software systems. Records; arrays; linked lists; queues; stacks; trees; graphs; storage management and garbage collection; recursive algorithms; searching and sorting; string matching; graph algorithms; time and space complexity. *(Fall, Spring) (Evenings)*

CSCI 6115. Advanced Topics in Algorithms and Data Structures. (3G) Prerequisite: CSCI 6114. Continuation and extension of CSCI 6114. Seminumerical algorithms; probabilistic algorithms; parallel algorithms; NP-completeness; computationally hard problems; approximation algorithms. *(On demand)*

CSCI 6132. Computer Modeling and Simulation. (3G) Prerequisites: CSCI 5131 and consent of department. Introduction to modeling of complex systems. Emphasis on modeling of computer systems and configurations. *(On demand)*

CSCI 6144. Operating Systems Design. (3G) Prerequisite: CSCI 6114 or consent of department. Introduction to features of a large-scale operating system with emphasis on resource-sharing environments. Computer system organization; resource management; multiprogramming; multi-processing; file systems; virtual machine concepts; protection and efficiency. *(Fall)(Alternate years) (Evenings)*

CSCI 6154. Heuristic Search. (3G) Prerequisite: CSCI 5150. Heuristics and problem representation; heuristic-search procedures; formal properties and performance analysis of heuristic methods; game-searching strategies and heuristic programming; search with probabilities; knowledge-guided search. *(On demand)*

CSCI 6155. Knowledge-Based Systems. (3G) Prerequisite: CSCI 5150. Knowledge representation; automatic deduction; techniques for handling uncertainty and inexact knowledge; principles of rule-based systems and frame-based systems. Selected study of actual knowledge-based systems and knowledge engineering tools. A course project of building a knowledge-based system. *(Spring) (Alternate years) (Evenings)*

CSCI 6156. Machine Learning. (3G) Prerequisite: CSCI 5150. Machine learning methods and techniques including: acquisition of declarative knowledge; organization of knowledge into new, more effective representations; development of new skills through instruction and practice; and discovery of new facts and theories through observation and experimentation. *(On demand)*

CSCI 6158. Natural Language Processing. (3G) Prerequisite: CSCI 5150. Principles, methodologies, and programming methods of natural language processing including foundations of natural language understanding, namely: lexical, syntactic, and semantic analysis, discourse integration, and pragmatic and morphological analysis. *(On demand)*

CSCI 6160. Database Systems, Design and Management. (3G) Prerequisite: CSCI 6114 or consent of the department. Introduction to principles of database design, and survey of alternative database organizations and structures. Logical database organization; schemas; subschemas; data description languages; hierarchical, network, and relational databases; database management systems; normal forms. *(Fall) (Evenings)*

CSCI 6161. Advanced Topics in Database Systems, Design and Management. (3G) Prerequisite: CSCI 6160. Continuation of CSCI 6160. Topics include addressing techniques; physical structures; searching; compaction techniques; storage hierarchies; multiple-key retrieval; efficiency and security considerations. *(On demand)*

CSCI 6164. Design and Implementation of Online Management Information Systems. (3G) Prerequisites: CSCI 6114 or consent of the department. The fundamental concepts and philosophy of planning and implementing an on-line computer system. Characteristics of on-line systems; hardware requirements; modeling of on-line systems; performance measurement; language choice for on-line systems; organization techniques, security requirements; resource allocation. *(On demand)*

CSCI 6166. Computer Communications and Networks. (3G) Prerequisite: CSCI 6114 or consent of the department. Introduction to the concepts of computer networks; their operating systems; and communication between nodes. Types of networks; communications and protocols; routing; message switching; optimization; distributed processing; coding and compaction. *(Spring) (Evenings)*

CSCI 6170. Logic for Artificial Intelligence. (3G) Prerequisite: CSCI 5150 or consent of the department. Introduction to basic concepts of logic for artificial intelligence, including declarative knowledge, inference, resolution, nonmonotonic reasoning, induction, reasoning with uncertain beliefs, distributed information systems, intelligent information systems, planning and intelligent-agent architecture. *(On demand)*

CSCI 6175. Computability and Complexity. (3G) Prerequisite: consent of the department. Study of computability, unsolvability, computational complexity. Concept of effective computability; recursive functions; mathematical models of computation; universal Turing machines; unsolvable problems; time and space complexity of computations; NP-complete problems; subrecursive hierarchies. *(On demand)*

CSCI 6690. Computer Science Seminar. (3G) Prerequisite: at least 18 graduate CSCI/CPGR hours and consent of department. Experience for the advanced M.S. student on current problems of computer design and application. (May be used by a student or small group of students to work with a professor on a topic of mutual interest. May be used to give a course on a topic announced in advance.) *(On demand)*

CSCI 6880. Individual Study. (1-3G) Prerequisites: At least 18 graduate CSCI/CPGR hours and consent of department. With the direction of a faculty member, students plan and implement appropriate objectives and

learning activities to develop specific areas of expertise through research, reading, and individual projects. May be repeated for credit. *(On demand)*

CSCI 6991. Computer Science Thesis. (0-6G) Prerequisite: consent of department. Graduate thesis research. Detailed exploration of an area of computer science chosen for thesis research. May be repeated for credit but no more than six hours may be applied to M.S. degree requirements. *(Fall, Spring, Summer)*

COUNSELING (CSLG)

Graduate and Advanced Undergraduate
CSLG 5100. Counseling Needs of Women. (3) (3G) Women's development and needs, the problems they bring to counselors, strategies for helping with them, myths about women and biases in psychological research. *(On demand)*

Graduate Only
CSLG 6000. Topics in Counseling. (1-6G) May include classroom and/or clinic experiences in the content area. With department approval, may be repeated for credit for different topics. *(Fall, Spring, Summer)*

CSLG 6100. Counseling Theory. (3G) Examination of the counseling relationship from various theoretical frameworks, including client-centered, psychoanalytic, Gestalt, transactional analysis, rational emotive, reality, and behavior theories. *(Fall, Spring, Summer)*

CSLG 6101. Ethical and Professional Issues In Counseling. (3G) Ethical and legal responsibilities, ethical standards, interpretations of laws by local authorities, and court decisions that impact the counseling profession. Skills of practical, ethical, and legal consultation are also emphasized. *(Fall, Summer)*

CSLG 6109. Research in Counseling. (3G) Examination of principles and practices for research and development of programs in counseling with emphasis on developmental designs, preventive programs, objectives and organizations. *(Summer)*

CSLG 6110. Counseling Techniques. (3G) Examination of concepts of individual counseling and the means for establishing facilitative relationships including competence in basic counseling skills and interventions. *(Fall, Spring, Summer)*

CSLG 6111. Advanced Counseling Techniques. (3G) Prerequisites: CSLG 6100 and 6110. Counseling interventions useful in facilitating client change and growth from an action-oriented, problem management perspective. Strategies for cognitive, affective, and behavioral change will be practiced. *(Fall, Spring, Summer)*

CSLG 6115. Person-to-Person Relationships. (3G) Examination of concepts and methods for improving human relationships. This course has an experiential component. *(On demand)*

CSLG 6120. Group Counseling. (3G) Investigation of concepts of group counseling and the means for developing facilitative interaction in groups which may include an experiential component as a major learning activity. *(Fall, Spring, Summer)*

CSLG 6121. The Leadership and Design of Structured Groups. (3G) Methods of creating psychoeducational groups. Focus on applying psychological theories to the selection of group content. Leadership issues such as screening, dealing with difficult members, and leader roles are addressed. *(Spring, Summer)*

CSLG 6145. Multicultural Counseling. (3G) Approaches to counseling that focus on multicultural differences so the counselor will be more effective in dealing with clients from a variety of cultural backgrounds. *(Fall)*

CSLG 6150. Career and Lifestyle Development. (3G) A counseling-oriented course designed to help the counselor and/or career education teacher develop the ability to use career information with emphasis on understanding of occupational information, systems of collection and usage forms. *(Fall, Summer)*

CSLG 6152. Approaches to Career Development (K-12). (3G) Counselors and vocational development coordinators gain an understanding and skills necessary for (1) the development, management and evaluation of a comprehensive, competency-based K-12 career education/ counseling program, (2) infusing career education into K-12 curriculum in a counselor/consultant capacity, and (3) establishing and leading successful individual and group career development activities. *(Spring)*

CSLG 6200. Introduction to Theories of Family Counseling. (3G) Examination of appropriate interventions in working with families focusing on major theorists and techniques in the field. Does not prepare students to function as marriage or family practitioners. *(Fall) (Alternate years)*

CSLG 6800. Individual Study in Counseling. (1-6G) Prerequisite: Permission of the student's adviser. Independent study under the supervision of an appropriate faculty member. May be repeated for credit. *(Fall, Spring, Summer)*

Advanced Graduate Only
CSLG 7110. Individual Assessment. (3G) Prerequisite: RSCH 6109 or PSYC 4140. Examination of the major aptitude, intelligence and other psychological tests commonly used in counseling with emphasis on test theory as well as the administration, scoring and interpretation of tests and the communication of their results. *(On demand)*

CSLG 7120. Administration and Supervision of Counseling Services. (3G) Planning, operation, implementation and supervision of counseling and guidance services in schools and agencies with emphasis on the development of administrative and supervisory skills. *(On demand)*

CSLG 7140. Elementary School Counseling and Guidance. (3G) Introduction to the guidance function in the elementary school with emphasis on the counselor's role in counseling, consulting and coordinating school and

community resources for the optimum benefit of the child. *(Fall, Summer)*

CSLG 7141. The Secondary School Counselor. (3G) Development of functional skills necessary for integration of counseling activities into secondary school curriculum. Focus on the role of the counselor in classroom guidance, consultation, program design, curriculum and administration of special programs. *(Spring)*

CSLG 7151. Approaches to Adult Career Development. (3G) Prerequisite: CSLG 6150. For the career development specialist who needs to survey an environment in which adults are seeking career counseling; assess needs; develop interventions strategies to meet needs; and assess outcomes. *(On demand)*

CSLG 7153. Research Techniques and Computer Applications in Career Counseling. (3G) Prerequisites: RSCH 6101, 6109 and 6110. Skills in preparing a literature review upon which to base a research study; critiquing theoretical, philosophical, and research material and reports; and conducting and reporting a research study. Focus on understanding the effective application of computer technology to the provision of career-related services in mental health, education, rehabilitative or other human services settings. *(On demand)*

CSLG 7170. Community Counseling and Management. (3G) Counseling in community agency settings, including the roles and functions of a professional counselor, assessing the needs of an agency population and the interworkings of various agencies and agency networks. *(Fall)*

CSLG 7190. Introduction to Pastoral Counseling. (3G) Prerequisites: CSLG 6100, 6110. Introduction to the field of pastoral counseling including both theological and counseling dimensions. *(On demand)*

CSLG 7191. Advanced Issues in Pastoral Counseling. (3G) Prerequisite: CSLG 7190. Specific content relevant to pastoral counseling including didactic and experiential foci. *(On demand)*

CSLG 7205. Techniques of Family Counseling. (3G) Prerequisites: CSLG 6100, 6200. An overview of techniques used by family counselors working from communications, structural or strategic orientations. *(On demand)*

CSLG 7430. Practicum in Counseling and Guidance. (3G) Prerequisites: CSLG 6100 and 6110. Supervision of individual and group counseling interventions conducted in field settings; special attention to the development of evaluative criteria for self and peer assessment. A minimum of 10 hours per week in field placement. Offered on a pass/no credit basis. May be repeated once for credit with departmental approval. *(Fall, Spring)*

CSLG 7435. Internship. (3G) Prerequisite: CSLG 7430. Students will participate in delivering counseling services in a field setting and receive supervision of their work in weekly seminars. A minimum of 20 hours per week in field placement. Offered on a pass/no credit basis. *(Fall, Spring)*

CSLG 7436. Advanced Internship. (3G) Prerequisite: CSLG 7435. Continuation of CSLG 7435. Students will function as counselors in field settings and have the opportunity to demonstrate advanced level skills in weekly seminars. A minimum of 20 hours per week in field placement. *(Fall, Spring)*

CSLG 7800. Individual Study in Counseling. (1-6G) Prerequisite of the student's adviser. Independent study under the supervision of an appropriate faculty member. May be repeated for credit. *(Fall, Spring, Summer)*

CSLG 7999. Graduate Residence. (0G) Meets Graduate School requirement for continuous enrollment during completion of capstone project or comprehensive examination. *(Fall, Spring)*

CURRICULUM AND INSTRUCTION (CURR)

Graduate Only

CURR 6120. Curriculum Theory. (3G) Study of theoretical constructs of curriculum and the nature of experience as they relate to facilitating theory into practice. Emphasis on research and experimentation in developing curriculum theory, processes, materials and relationships. *(Fall, Spring, Summer)*

CURR 6122. Curriculum Development. (3G) Planning, development and evaluation of curricular programs. *(On demand)*

CURR 6150. Models of Teaching. (3G) Prerequisites; EDUC 6100, RSCH 6101, and CURR 6120. Learning theory associated with information processing, personal, social, and behavioral models; current trends in instructional methodology for a variety of content areas. *(Spring)*

Advanced Graduate Only

CURR 7121. Advanced Instructional Design and Evaluation. (3G) Learning theory-based instructional systems design models and procedures, norm- and criterion-referenced testing, instructional projects management, and instructional evaluation. Focus on school system level applications of instructional design and evaluation principles for the improvement of instruction. *(On demand)*

CURR 7122. Advanced Curriculum Theory. (3G) An examination of philosophic thought and its relationship to educational theories which have led to assumptions for educational practices in American schools. *(On demand)*

DANCE (DANC)

Undergraduate

DANC 1101. American Dance: A Cultural Reflection. (A) (3) Examination of how the dance of other cultures is reflected in American Dance; what impact the socio-political climate has on the development of dance forms; how popular culture has influenced dance expression through lectures, film, video, and live dance performances. *(Fall, Spring)*

DANC 1103. Introduction to Dance. (1) Prerequisite: Non-majors only. Studio experience with movement

characteristics of ballet, modern dance and jazz dance for the beginner. Two contact hours. *(On demand)*

DANC 1201. Contemporary Dance Techniques, Style and Theory I. (4) Prerequisite: Dance major or minor or permission of instructor. Movement training including ballet and modern dance and incorporating basic principles of anatomy and kinesiology. Nine contact hours. *(Fall, Spring)*

DANC 1202. Contemporary Dance Technique, Style and Theory II. (4) Prerequisite: DANC 1201, or consent of instructor. Continuation of DANC 1201 which incorporates basic music fundamentals and materials for dancers. Nine contact hours. *(Fall)*

DANC 1212. Ballet I. (2) Fundamentals of ballet technique, barre and floor work. May be repeated for credit. Three contact hours. *(Fall, Spring) (Evenings)*

DANC 1213. Ballet II. (2) Prerequisite: DANC 1212 or consent of instructor. Continuation of DANC 1212. May be repeated for credit. Three contact hours. *(Fall, Spring)*

DANC 1214. Modern Dance I. (2) Combination of improvisation, effort-shape, elementary modern styles. May be repeated for credit. Three contact hours. *(Fall, Spring) (Evenings)*

DANC 1215. Modern Dance II. (2) Prerequisite: DANC 1214, or consent of instructor. Continuation of DANC 1214. May be repeated for credit. Three contact hours. *(Spring) (Fall on demand)*

DANC 2201. Contemporary Dance Technique, Style and Theory III. (3) Prerequisite: DANC 1202, or consent of instructor. Higher level movement training which includes ballet, modern dance and jazz dance. Six contact hours. *(Spring)*

DANC 2202. Contemporary Dance Technique, Style and Theory IV. (3) Prerequisite: DANC 2201 or consent of instructor. Continuation of DANC 2201. May be repeated for credit with not more than six hours applied toward required dance electives. Six contact hours. *(Fall)*

DANC 2216. Elements of Dance Composition. (3) Prerequisites: DATH 1100, 1200, and DANC 1201, or consent of instructor. Exploration of fundamental elements and concepts for composing dance, dance/theatre, and performance art works. Six contact hours. *(Spring)*

DANC 2222. Ballet III. (2) Prerequisite: DANC 1213 or consent of instructor. Intermediate ballet; barre and centerwork. May be repeated for credit. Three contact hours. *(Fall)*

DANC 2223. Ballet IV. (2) Prerequisite: DANC 2222 or consent of instructor. A continuation of DANC 2222. May be repeated for credit. Three contact hours. *(Spring)*

DANC 2224. Modern Dance III. (2) Prerequisite: DANC 1215 or consent of instructor. Intermediate modern dance technique. May be repeated for credit. Three contact hours. *(Fall)*

DANC 2225. Modern Dance IV. (2) Prerequisite: DANC 2224 or consent of instructor. A continuation of DANC 2224. May be repeated for credit. Three contact hours. *(Spring)*

DANC 2226. Jazz Dance I. (1) Traditional jazz dance style. May be repeated for credit. Three contact hours. *(Fall, Spring)*

DANC 2227. Jazz Dance II. (1) Contemporary jazz dance styles. May be repeated for credit. Two contact hours. *(Spring)*

DANC 3001. Topics in Dance. (1-3) Special topic in dance. May be repeated for credit with change in topic. Two to six contact hours. *(On demand)*

DANC 3101. Dance History I. (A)(3) Historical and cultural influences affecting the development of dance in the 20th century. *(Fall) (Alternate years)*

DANC 3102. Dance History II. (A)(3) Historical and cultural developments of theatrical dance from the Renaissance to the 20th century. *(Spring) (Alternate years)*

DANC 3110. Dance Criticism. (W) (3) Prerequisite: DANC 1101 or DANC 3101. Twentieth century dance forms are used as a basis for discussion and written commentary. *(Spring) (Alternate years)*

DANC 3227. Dance Education Methods I. (3) Prerequisites: DANC 1202 or consent of instructor. Corequisite: DANC 3227L. Creative movement theories; techniques and skills for teaching the elementary school child. *(Fall)*

DANC 3227L. Elementary Clinical Experience. (1) Corequisite DANC 3227. Observation and teaching in an elementary school setting. Application of methodologies introduced in DANC 3227. (2 contact hours) *(Fall)*

DANC 3230. Choreography. (3) Prerequisites: DANC 2201, 2216. Methods and sources of dance composition. Six contact hours. *(Fall)*

DANC 3257. Dance Education Methods II. (3) Prerequisite: DANC 1202 or consent of instructor. Corequisite: DANC 3257L. Experiences in techniques for teaching dance in secondary schools. *(Spring)*

DANC 3257L. Secondary Clinical Experience. (1) Corequisite: DANC 3257. Observation and teaching in a secondary school setting. Application of methodologies introduced in DANC 3257. (2 contact hours) *(Spring)*

DANC 3400. Internship in Dance. (3-6) Prerequisite: GPA of at least 2.5, junior status, and permission of department chair. Research and/or in-service training for dance majors and minors in cooperating organizations. Specific content based upon a contract between the student, department, and professional organization. Graded on a pass/fail basis. *(Fall, Spring, Summer)*

DANC 3467. Student Teaching/Seminar: K-12 Fine and Performing Arts: Dance (15) Prerequisite: approved application for student teaching; senior status; completion of professional education requirements; grades of *C* or

better in all courses required for licensure. Corequisite: enrollment only in student teaching. A planned sequence of experiences in the student's area of specialization conducted in an approved school setting under the supervision and coordination of a university supervisor and a cooperating teacher in which the student demonstrates the competencies identified for his/her specific teaching field in an appropriate grade level setting. *(Fall, Spring)*

DANC 3601. Individual Project. (3) Prerequisite: Permission of department chair. May be repeated for credit. *(Fall, Spring, Summer)*

DANC 3691. Individual Project (6) Prerequisite: Permission of department chair. May be repeated for credit. *(Fall, Spring, Summer)*

DANCE AND THEATRE (DATH)

Undergraduate
DATH 1100. Exploration of Voice and Movement (3). Communication of emotion and intention through movement and vocalization exercises and improvisation. Six contact hours. *(Fall, Spring)*

DATH 1200. Elements of Design for the Stage (3). Elements and principles of design in relation to the performer, performance and performance space with emphasis on developing perceptual and communication skills through exposure to and analysis of a diverse selection of dance, theatre, and related-performance images. *(Spring)*

DATH 1600. Cornerstone Seminar. (1) Prerequisite: Restricted to dance and threatre majors and minors or permission of instructor. Reading, viewing, writing and discussion focusing on the functions of dance and theatre within society including contemporary trends and current research/creative activity. Two contact hours. Graded on a pass/fail basis. *(Fall)*

DATH 2401. Production Practicum. (1) Practical application of production work in the areas of scenery, lighting, sound, costuming, properties, publicity, box office, house management, and stage management. May be repeated for credit. *(Fall, Spring)*

DATH 2402. Performance Practicum. (1) Prerequisite: Audition. Practical application of performance techniques within a production setting including auditions, rehearsals and performances. May be repeated for credit. *(Fall, Spring)*

DATH 3600. Capstone Seminar. (1) Prerequisites: DATH 1600 and senior standing. Synthesis, integration and application of theoretical and experiential study in dance and theatre through individual/group designed seminar topic. Investigation and planning for immediate and life-long career options through guest lectures, panel discussions, site visits, presentations, and related mini-projects. Two contact hours. Graded on a pass/fail basis. *(Fall)*

ECONOMICS (ECON)

Undergraduate
ECON 1090. Topics in Economics. (1-3) Consideration of topics from the areas of economic theory, economic development, consumer economics, welfare economics and current economic problems. May be repeated for credit as topics vary. *(On demand)*

ECON 1101. Economics for Non-Majors. (3) Economic issues without emphasis on theoretical models. Contemporary economic issues such as pollution control, consumer protection and the energy crisis. May not be taken for credit if credit has already been received for either ECON 1201 or 1202. *(On demand)*

ECON 1201. Principles of Economics-Macro. (C) (3) Scope and methodology of economics as a social science, the measurement of national income, the theory of national income determination, money and banking, monetary and fiscal policy, and international economics. (Formerly ECON 2101) *(Fall, Spring, Summer) (Evenings)*

ECON 1202. Principles of Economics-Micro. (C) (3) Pricing mechanism of a market economy, the industrial organization of the U.S. economy, problems of economic concentration, the theory of income distribution, and comparative economic systems. (Formerly ECON 2102) *(Fall, Spring, Summer) (Evenings)*

ECON 2105. Consumer Economics. (3) Economic analysis of consumer issues with emphasis on economic decision making. Topics include consumer protection and government regulation, determination of family income, advertising, health care, inflation, taxation, and investment decisions. May not be taken for upper-level credit in business or economics, but may be taken for general University credit. *(On demand)*

ECON 3090. Topics in Economics. (3) Prerequisite: consent of the Department. Topics from the areas of economic theory, economic development, consumer economics, welfare economics and current economic problems. May be repeated for credit. *(On demand)*

ECON 3105. Industrial Relations. (3) Prerequisite: introductory course in economics or consent of instructor. Systematic analysis of the sociological, economic and legal forces affecting the work environment. Emphasis on labor unions and employment law. *(Fall, Spring)*

ECON 3106. Labor Economics. (3) Prerequisites: ECON 1201 and 1202. Economics of labor markets with emphasis on wage and employment theory, collective bargaining, and human capital theory. Historical and legal forces affecting labor markets. *(Spring)*

ECON 3107. Employment Law. (3) Legal principles and legislation which control employment decisions in union and non-union settings. Topics include fair employment practices, anti-discrimination law, representation elections, unfair labor practices and dispute settlement processes. (Same as MGMT 3243.) *(On demand)*

ECON 3112. Econometrics. (3) Prerequisites: ECON 1201 and 1202, MATH 1120 or 1241, STAT 1220 and INFO 2130. Econometric techniques including simple and multiple least squares regression with problems and analyses. *(Fall, Summer)*

ECON 3114. Research Methods. (3) Prerequisites: STAT 1220, INFO 2130, and ECON 3112 or 3117. Introduction

to research in economics including major sources of data and information and application of elementary research methods to economic problems. *(On demand)*

ECON 3115. Money and Banking. (3) Prerequisite: ECON 1201. The characteristics and functions of money in the modern economy, monetary theory and policy, and financial institutions. *(Fall, Spring, Summer)*

ECON 3122. Microeconomic Analysis. (3) Prerequisites: ECON 1201 and 1202 and MATH 1120 or 1241. Microeconomic analysis with emphasis on consumer theory and the theory of production. Resource allocation and the determination of optimum output and pricing by a firm operating under various market structures. Distribution and welfare theories. *(Fall)*

ECON 3123. Macroeconomic Analysis. (3) Prerequisites: ECON 1201 and 1202 and MATH 1120 or 1241. Analysis of economic aggregates with inflation, unemployment, and income determination. Keynesian, Classical, Monetarist, and supply side models. *(Spring)*

ECON 3125. Economics of the Firm. (3) Prerequisites: ECON 1202, MATH 1120 or 1241, and STAT 1220. Economic decisions of particular interest to business firms, e.g., demand theory and forecasting; cost analysis and pricing policies. *(Fall, Spring, Summer) (Evenings)*

ECON 3131. Economic History of the United States. (3) Prerequisite: ECON 1101 or 1201 or 1202. Use of economic models to further understanding of the growth and development of the U.S. economy from colonial times to the Great Depression. Emphasis on the sources and consequences of American growth, with particular emphasis on technological, demographic, and institutional changes. *(On demand)*

ECON 3133. Economic History of Europe. (3) Prerequisite: ECON 1101 or 1201 or 1202. Use of economic models to understand economic development of Europe from the early modern period to the present. Emphasis on the demographic, institutional, and technological changes underlying economic growth and the impact of European economic growth on the rest of the world through international trade, investment, and migration. *(On demand)*

ECON 3171. International Economics for Non-Majors. (3) Prerequisite: ECON 1201 and 1202. Survey of international trade and international monetary theory including determination of international trade patterns, welfare implications of international trade and trade restrictions, economic integration, exchange rate determination, and the balance of payments. (Not an economics elective for economics majors or minors.) Credit will not be given for ECON 3171 where credit has already been given for ECON 4171 or 4172. *(On demand)*

ECON 3175. Comparative Economic Systems. (3) Prerequisite: ECON 1202. Compares and contrasts capitalism, socialism, and communism both in theory and practice. *(Fall)*

ECON 3200. Foundations in Economics (3) Overview of microeconomic and macroeconomic concepts. Microeconomics: scarcity, opportunity costs, marginal analysis, demand, supply and market structures. Macroeconomics: present values, national income accounting, interest rates, real values versus nominal values, monetary and fiscal policy, balance of payments, and economic growth. (Economics preparation to enter MBA program. Cannot be taken for credit toward any undergraduate degree within the Belk College of Business Administration or used as equivalent credit for ECON 1201 - 1202. Credit will not be given for ECON 3200 where credit has been given for ECON 1201 or ECON 1202.) *(Fall, Spring)*

ECON 3500. Cooperative Education Experience. (0) Enrollment in this course is required for the Department's Cooperative Education students during each semester they are working in a Co-op position. Restricted to majors in the Department of Economics. Course evaluation is Satisfactory/Unsatisfactory. *(Fall, Spring, Summer)*

ECON 3895. Directed Individual Study. (1-3) Prerequisites: permission of the instructor and the Department. Independent study of a theoretical and/or a policy problem in a special area of economics. Students may pursue a particular program in depth. Topics of the investigation may originate from the student or from the faculty member supervising the study. May be repeated for credit. *(Fall, Spring, Summer) (Evenings)*

Undergraduate/Available for Graduate Credit

Additional work required for graduate credit.

ECON 4100. Mathematical Economics. (3) (3G) Prerequisites: ECON 1201 and 1202 and MATH 1120 or 1241. Both microeconomic and macroeconomic problems are analyzed with quantitative techniques. Emphasis is given to the study of methods for mathematically formulating economic relationships including the tools used for finding maximums, minimums and limits to single, recursive and simultaneous economic relationships. Not available for credit in the M.S. program in Economics. *(Alternate years)*

ECON 4102. Economics for School Teachers. (3) (3G) Prerequisite: permission of the instructor for students not majoring in education. Emphasis on economic concepts and issues that lend themselves to grades K-12 classroom presentation. Includes the development, meaning and functioning of institutions that characterize the U.S. economy. Not accepted for graduate credit in the M.B.A. program or M.S. in Economics program. *(Fall, Spring)*

ECON 4105. Negotiations and Bargaining Strategy. (3) (3G) Prerequisites: ECON 1202 and 3105. Theories of negotiation strategy. Emphasis on the negotiation of collective bargaining contracts. Topics include the use of arbitration, mediation, conciliation and fact-finding boards to resolve disputes. *(On demand)*

ECON 4112. Econometrics II. (3) (3G) Prerequisite: ECON 3112 or consent of instructor. Tools of analysis are more extensive and of a greater depth than those studied in ECON 3112. Regression and correlation techniques are applied to economic and business problems derived from government and business environments. Not available for credit in the M.S. program in Economics. *(Alternate years)*

ECON 4116. Public Sector Economics. (3) (3G) Prerequisite: ECON 3122. Revenue and expenditure problems of governmental units, intergovernmental financial relationships and the impact of federal fiscal policy upon the American economy. *(On demand)*

ECON 4117. Business and Economic Forecasting. (3) (3G) Prerequisite: ECON 3112. Analysis of fluctuations in economic activity, including production, employment, prices and industry sales. Topics include forecasting methods, business cycle theories, historical record, industry and sales forecasting. Not available for credit in the M.S. program in Economics. *(On demand)*

ECON 4135. Economics of Development. (3) (3G) Prerequisite: ECON 1202. Theories of economic growth and development applied to varying economic and social systems. Current theoretical models and their relevance to efficient allocation of resources to both the developed and the developing nations. *(On demand)*

ECON 4150. Urban and Regional Economics. (3) (3G) Prerequisite: ECON 1202. Spatial and economic organization of cities and regional areas and their special economic problems. Topics include economic growth, urban location and land use, poverty, housing, public finance and urban transportation. *(On demand)*

ECON 4160. Economics of Transportation. (3) (3G) Prerequisite: ECON 1202. Analysis of transportation systems. Topics include the historical development of various modes, costs and rate-making, regulation and national transportation policy. *(On demand)*

ECON 4171. Economics of International Trade. (3) (3G) Prerequisite: ECON 3122. Theory of international trade including determination of international trade patterns, welfare implications of international trade, economic integration, and effects of tariffs and quotas. *(Fall)*

ECON 4172. Economics of International Finance. (3) (3G) Prerequisite: ECON 3123. Survey of international monetary theory. Topics include exchange rate determination, balance of payments and adjustment, international liquidity, capital movements, international financial organizations and monetary reform proposals. *(Spring)*

ECON 4177. History of Economic Thought. (W) (3) (3G) Prerequisites: ECON 1201 and 1202. History of economics as a science and the evolution of theories of value, distribution and employment. Review of the works of Adam Smith, Thomas Malthus, David Ricardo, Karl Marx, Alfred Marshall, Thorstein Veblen, and John Maynard Keynes. *(Spring)*

ECON 4180. Industrial Organization and Public Policy. (3) (3G) Prerequisite: ECON 3122. An examination of monopolistic competition, oligopoly, and monopoly and questions of public policy in dealing with problems created by industrial concentration. *(Fall, Summer)*

ECON 4181. Energy and Environmental Economics. (3) (3G) Prerequisite: ECON 1202. Economic issues of both energy and environment. Energy issues include the historical development of energy resources, supply and demand considerations and projections of the future energy balance. Environmental issues are externalities, common property resources and government regulation. Policy considerations include environmental standards, pollution charges and property rights. Cost-benefit analysis and microeconomic theory are applied. *(On demand)*

ECON 4182. Public Utilities. (3) (3G) Prerequisite: ECON 1202. Economic issues of public utilities, with emphasis on the theory and methods of rate-making and regulation. *(On demand)*

ECON 4449. Work-Study Program in Economics. (3-6 or 3-6G hours credit, by determination of Department of Economics.) Prerequisites: ECON 1201 and 1202 and permission of the Department of Economics. Prior to enrollment, plans for the student's work assignments in this course must be completed. Assignments in government, utilities, banking and other paid employment must utilize the techniques and principles learned in core requirements in economics. Work assignments require faculty contact with the student and employer to insure satisfactory performance by the student. A maximum of three hours can be used to meet upper-level economics elective requirements. Not available for credit in the M.S. program in Economics. *(Fall, Spring, Summer) (Evenings)*

Graduate Only (Permission of Economics Graduate Coordinator Required)

ECON 6001. Advanced Topics in Macroeconomics. (3G) Prerequisites: ECON 6112, 6201 and 6202. Advanced treatment of selected issues in macroeconomics. *(On demand)*

ECON 6002. Advanced Topics in Microeconomics. (3G) Prerequisites: ECON 6112, 6201 and 6202. Advanced treatment of selected issues in microeconomics. *(On demand)*

ECON 6090. Topics in Economics. (1-3G) Prerequisite: consent of the department. Topics from various areas of economics. Credit hours will vary with the topic offered. May be repeated for credit as topics vary. *(On demand)*

ECON 6100. Graduate Mathematical Economics. (3G) Economic problems are analyzed with quantitative techniques. Topics covered include the study of economic growth models, utility maximization, homogeneous functions, dynamic systems, applications of linear programming, and constrained optimization. *(On demand)*

ECON 6112. Graduate Econometrics. (3G) Advanced study of the theory and application of statistics as it relates to economic problems. Topics include: identification and estimation of simultaneous systems of equations, seasonal adjustment, autocorrelated disturbances, maximum likelihood estimation. *(Fall)*

ECON 6120. Economics of Futures and Options Markets. (3G) Prerequisites: ECON 6112, 6202. Analysis of futures and options markets. Topics include: theory and application of rational expectations to commodity futures and options, theory and application of economics under uncertainty, statistical behavior of commodity futures and

options prices, hedging, regulation of commodity futures markets, and analysis of the success and failure of commodity futures contracts. *(On demand)*

ECON 6201. Advanced Macroeconomic Theory. (3G) Prerequisites: Admission to graduate program. Theories of aggregate income determination, inflation, unemploy-men, interest rates and economic growth; macro-economic consumption and investment behavior; the business cycle. *(Fall)*

ECON 6202. Advanced Microeconomic Theory. (3G) Prerequisite: admission to graduate program. Theories of the firm, of the consumer, and of resource owners; determination of prices under different market structures; general equilibrium analysis and welfare economics. *(Fall)*

ECON 6218. Advanced Business and Economic Forecasting. (3G) Prerequisite: ECON 6112. Develops forecasting techniques used in business decision making and techniques used in forecasting macroeconomic variables. Topics include: estimation, identification and prediction using ARMAX, state space and Box-Jenkins models; spectral analysis; linear filtering. *(Spring)*

ECON 6235. Monetary and Financial Theory. (3G) Prerequisites: ECON 6112, and either ECON 6201 or 6202. Theory and empirical tests of money supply, money demand, and financial markets; portfolio theory with special attention to portfolio choices of banks; term structure of interest rates; dynamic models of money and economic activity. (*Spring, Summer*)

ECON 6240. Economics of International Finance. (3G) Prerequisites: ECON 6112, 6201 and 6202. Open economy macroeconomics, international transmission of inflation and unemployment, internal and external balance; balance of payments and international payments mechanisms; determination of exchange rates and effects of hedging and speculation. (*Spring, Summer*)

ECON 6241. Economics of International Trade. (3G) Prerequisites: ECON 6112, 6201 and 6202. Examines the causes and consequences of trade using Ricardian and neoclassical models. Considers extensions, modifications and empirical tests of these models. Analysis of tariffs, quotas and other trade restrictions, export subsidies and trends in current trade policy. (*On demand*)

ECON 6250. Advanced Urban and Regional Economics. (3G) Prerequisite: admission to graduate program. Applications of microeconomic theory to problems of cities, metropolitan areas and regions; methods in regional analysis, location theory, land-use planning, measurement of economic activity; transportation, housing, poverty, and growth issues. *(On demand)*

ECON 6260. Managerial Decision Making. (3G) Prerequisites: ECON 6112, 6201 and 6202. Decision making by firms; demand and production functions, relation between cost and production functions; risk analysis. (*Spring, Summer*)

ECON 6800. Directed Study in Economics. (1-3G) Prerequisites: Admission to M.S. program in Economics. Independent study of a theoretical and/or a policy problem in a special area of economics. Topics of the investigation may originate from the student or from the faculty member supervising the study. May be repeated for up to 6 hours of credit with the approval of the Graduate Coordinator. *(On demand)*

ECON 6901. Research Methods for Economists I. (3G) Prerequisites: ECON 6112, 6202 and either ECON 6201 or MBAD/FINN 6157. Research programs in economics; problem identification; interpretation of statistical results, bibliographic search, data sources and collection, selection of statistical technique, preparation of reports and proposals. *(Spring)*

ECON 6902. Research Methods for Economists II. (3G) Prerequisites: ECON 6901. Critique of economic research and reports, presentation of econometric results and reports. The student will develop a research project, perform statistical tests, and present the results orally and in a major research paper. *(Summer)*

ECON 6999. Graduate Thesis Research. (0-6G) Individual investigation culminating in the preparation and presentation of a thesis. May be repeated for credit. *(On demand)*

EDUCATION (EDUC)

Undergraduate
EDUC 2100. Introduction to Education and Diversity in Schools. (C) (3) Corequisite: SPED 2100. Social, historical, and philosophical foundations of the educating professions, the organization and various levels of education, and the major issues in American education. Field-based activities in observing in class and non-classroom settings: 5 hours. *(Fall, Spring, Summer)*

EDUC 2150. Human Development Across the Life Span. (C) (3) Biological, psychological and social development throughout the life span. *(Fall, Spring, Summer)*

Graduate and Advanced Undergraduate
EDUC 5000. Topics in Education. (1-6) (1-6G) May include classroom and/or clinical experiences in the content area. With department approval, may be repeated for credit for different topics. *(Fall, Spring, Summer)*

Graduate Only
EDUC 6000. Topics in Education. (1-6G) May include classroom and/or clinic experiences in the content area. With department approval, may be repeated for credit for different topics. *(Fall, Spring, Summer)*

EDUC 6100. Theories of Human Development and Learning. (3G) Concept of development; philosophical antecedents of developmental and learning theories; role of theory in explaining human nature; components of theoretical explanations; evaluating theories. *(Fall, Spring)*

EDUC 6102. The Person and School in Urban Society. (3G) The basic philosophical theories and sociocultural forces that influence the objectives, structure and programs of schools, agencies and institutions in urban society. *(On demand)*

EDUC 6651. Piagetian Theory. (3G) Prerequisite: Permission of the instructor. Advanced seminar for investigation of Piagetian theory with emphasis on genetic epistemology, research and neo-Piagetian concepts. *(On demand)*

EDUC 7126. Comparative Education. (3G) Analysis of sociocultural forces affecting educational planning and comparison of contemporary educational systems of selected countries and the United States. *(On demand)*

ELECTRICAL ENGINEERING (EEGR)

Undergraduate

EEGR 2103. Computer Utilization in C++. (2) Prerequisite: ENGR 1201 and 1202 with grade of C or better. Corequisite: EEGR 2111. Structure and object-oriented programming paradigms; introduction to linear algebra; Intermediate-level methods in C++ applied to problems from network theory. *(Fall, Spring) (Evenings)*

EEGR 2111. Network Theory 1. (3) Corequisite: EEGR 2101 or CSCI 2113. Prerequisite or corequisite: PHYS 2101 and MATH 2171. Introduction to Kirchoff's and terminal equations. Circuit analysis techniques and network theorems. Singularity functions and signals. Transient and natural response of first and second order networks. State variable analysis. *(Fall, Spring) (Evenings)*

EEGR 2112. Network Theory II. (3) Prerequisite: EEGR 2111 with a grade of *C* or better and MATH 2171. Continuation of EEGR 2111. Introduction of sinusoidal steady state. Time frequency domain analysis. Power and energy. Two port networks. Fourier series. Introduction to Fourier and Laplace transforms. *(Fall, Spring, Summer) (Evenings)*

EEGR 2151. Basic Electrical Engineering Laboratory. (1) Prerequisite or corequisite: EEGR 2163. Principles and operation of electrical circuits, basic electronic devices and energy conversion devices. Not open to Electrical Engineering majors. Three lab hours a week. *(On demand)*

EEGR 2152. Laboratory I. (2) Prerequisite: ENGL 1101. Prerequisite or corequisite: EEGR 2112. The first in a series of laboratory-oriented courses designed to develop an understanding of the principles and theory of parameter measurement and instrumentation. Instruction in the use of laboratory equipment and development and application of experimental techniques. One hour of lecture and three laboratory hours per week. *(Fall, Spring) (Evenings)*

EEGR 2155. Logic and Networks Laboratory. (W) (1) Prerequisites: MATH 1241 and 1242. Corequisites: EEGR 2111 and 2181 or permission of Department. Network measurements and applications, experimental logic design; introduction to laboratory equipment and techniques. *(Fall, Spring, Summer) (Evenings)*

EEGR 2156. Instrumentation and Networks Laboratory. (W)(1) Prerequisite: EEGR 2155. Corequisite: EEGR 2112 or permission of Department. Network measurements, applications, and instrumentations. *(Fall, Spring, Summer) (Evenings)*

EEGR 2161. Basic Electrical Engineering I. (3) Corequisite or prerequisite: PHYS 2102. Fundamental concepts and methods of analysis used in electrical engineering. Topics include: terminal characteristics of devices, analysis of D.C. and A.C. circuits, elementary operation of electronic devices. Not open to Electrical Engineering majors. *(Fall) (Evenings)*

EEGR 2162. Basic Electrical Engineering II. (3) Prerequisite: EEGR 2161. Continuation of EEGR 2161 covering electronics, magnetic fields, electromagnetic and electromechanical devices. Not open to Electrical Engineering majors. *(Spring) (Evenings)*

EEGR 2163. Electrical Engineering Survey. (3) Prerequisite: MATH 1242. Corequisite: PHYS 2102. Fundamental concepts and methods of analysis used in electrical engineering. Topics include: terminal characteristics of devices, analysis of D.C. and A.C. circuits, elementary operation of electronic devices and electromechanical energy conversion devices. Not open to Electrical Engineering majors. *(On demand)*

EEGR 2181. Logic System Design I. (3) Prerequisite or corequisite: EEGR 1102 or CSCI 1100 or 1201 and its lab, or permission of department. Introduction to Boolean algebra; mixed logic; design of combinational circuits; introduction to sequential systems; MSI building blocks; includes laboratory design projects. *(Fall, Spring)*

EEGR 2182. Logic System Design II. (3) Prerequisite: EEGR 2181 with a grade of *C* or better or permission of the department. Continuation of EEGR 2181. Multi-input and output controllers using top down design; logic design using MSI and LSI. Bit-slice controllers; including laboratory design project and techniques. *(Spring, Summer)*

EEGR 2252. Electrical Engineering Design I. (2) Prerequisites: EEGR 2155 and 2111. Corequisites: EEGR 2112 and 2156. Introduction to conceptual design; circuit design; parameter sensitivity analysis; cost-performance tradeoff analysis and interconnection compatibility design. A design project completed in a laboratory setting and written technical report and oral presentation of the project are required. *(Fall, Spring)*

EEGR 3090. Special Topics in Electrical Engineering. (1-4) Prerequisite: consent of the department. The course builds upon and synthesizes knowledge from the engineering science, mathematics and physical sciences stem of the core curriculum. The specific topics teach engineering analysis, synthesis and design, while simultaneously affording an opportunity for the students to investigate an area of specialization. May be repeated for credit. *(On demand)*

EEGR 3111. Signal and Systems. (3) Prerequisite: EEGR 2112 with a grade of *C* o better. Analysis of networks under transient and steady state conditions. Topological and matrix formulation techniques used in network analysis. Transient and steady state analysis. State variable techniques. Transform methods. Sinusoidal steady state. Network theorems. *(Fall, Spring)*

EEGR 3112. System Analysis II. (3) Prerequisite: EEGR 3111 with a grade of *C* or better. A continuation of EEGR 3111 emphasizing system response characteristics in the frequency domain. Introduction to techniques of analysis of continuous and discrete systems. *(Spring, Summer)*

EEGR 3121. Introduction to Electromagnetic Fields. (3) Prerequisites: EEGR 2112 with a grade of *C* or better and MATH 2241. A study of electric and magnetic fields using the vector formulation. Vector analysis. Electrostatics: potential functions, dielectrics, capacitance, energy and forces associated with electric fields, solution of Laplace's and Poisson's equations. Magnetostatics: vector potential functions, Lorentz forces, hysteresis, magnetic polarization and induction, and energy. Gauss's, Ampere's, Faraday's laws, etc., leading to the Maxwell's equations. *(Fall, Spring)*

EEGR 3122. Electromagnetic Waves. (3) Prerequisite: EEGR 3121 with a grade of *C* or better. A study of Maxwell's equations, transmission line theory, plane waves in media, propagation of electromagnetic waves in various media. The phenomena of reflection and refraction at interfaces of two dissimilar materials. Guided electromagnetic waves in coaxial cables and waveguides. *(Spring, Summer)*

EEGR 3131. Fundamentals of Electronics and Semiconductors. (3) Prerequisite: EEGR 2112 with a grade of *C* or better. Study of the fundamental concepts of the theory and applications of semiconductor devices. Diode characteristics and applications, including clipping and rectifier circuits. Transistor fundamentals. D.C. biasing and stabilization. Small-signal analysis. Field-effect transistors. Operational amplifier fundamentals. *(Fall, Spring)*

EEGR 3132. Electronics. (3) Prerequisite: EEGR 3131 with a grade of *C* or better. Low and high-frequency analysis of transistor amplifiers. Multistage and feedback amplifier design. Stability and oscillation. Operational amplifier design and applications. *(Spring, Summer)*

EEGR 3134. Industrial Electronics. (3) Prerequisite: EEGR 3132 with a grade of *C* or better. High power solid state circuits. Topics include choppers, phase controlled rectifiers, triggering devices, inverters and dual converters, limiting and regulating circuits. *(Spring)*

EEGR 3142. Electromagnetic Devices. (3) Prerequisite: EEGR 3121 with a grade of *C* or better. Principles of operation and basic design features of electromechanical energy converters. The role of the magnetic field in transformers and electrical machines. Generation of induced voltages. Electromagnetic torque development. Speed control. Circuit models and machine performance. *(Spring, Summer)*

EEGR 3155. Systems and Electronics Laboratory. (1) Prerequisites: EEGR 2112, and 2156. Corequisites: EEGR 3111 and 3131, or permission of Department. Systems and signals measurements and applications; electronic circuits. *(Fall, Spring, Summer) (Evenings)*

EEGR 3156. Electromagnetic and Electronic Devices Laboratory. (1) Prerequisite: EEGR 3155. Corequisite: EEGR 3142, 3133, or permission of Department. Measurements and applications of electromagnetic and solid state devices. *(Fall, Spring, Summer) (Evenings)*

EEGR 3157. Electrical Engineering Design II. (2) Prerequisite: EEGR 2156 and 2112. Corequisite: EEGR 3155 or permission of Department. Application of conceptual design; circuit design; parameter sensitivity analysis; cost-performance tradeoff analysis and interconnection compatibility design. A design project completed in a laboratory setting and a written technical report and oral presentation on the project are required. *(Fall, Spring)*

EEGR 3159. Electrical Engineering Professional Practice. (2) Prerequisites: Senior Standing and EEGR 3253. Corequisite: EEGR 3254 or permission of Department. Engineering ethics; safety and liability in the manufacturing workplace; product design; product development; cost estimating for non-recurring engineering work; production planning; Total Quality Management; and effective technical presentation. *(Fall, Spring)*

EEGR 3181. Computer Organization and Microprogramming. (3) Prerequisite: EEGR 2182 with a grade of *C* or better or permission of department. Microcomputer development and architecture, micro-programming, chip-slice microprocessors. *(Fall, Spring)*

EEGR 3182. Digital Logic Design. (3) Prerequisites: EEGR 2181 and 3131, both with a grade of *C* or better. Bipolar and field-effect transistors, switching characteristics, device models, logic families. Memory devices, one-shots, Schmitt triggers, logic gates, drivers. Use of logic analyzers. *(Spring, Summer)*

EEGR 3183. Programming Languages. (3) Prerequisite: CSCI 2161. Topics include structure of simple statements and algorithmic languages, list processing, manipulation and text editing, linear-time parsers/interpreters/compilers. Emphasis on application of these concepts to engineering systems including programmable logic controllers and mini/micro computers as process controllers. *(On demand)*

EEGR 3199. Professional Development. (0) The purpose of this course is to broaden the student's perception of engineering as a career through participation in various activities related to the engineering profession. Activities consist of attendance at professional society meetings, active participation in student organizations, attendance at visiting lectures and seminars, etc. Course requirements are spread over a two-year period. Students will write two comprehensive reports, each of which concerns one of the above topics. Students must schedule this course during each of the three semesters prior to their last for zero credit and for one credit on a *Pass/No Credit* basis during their final semester. Satisfactory completion of this course is required for graduation for all Electrical Engineering majors. *(Fall, Spring)*

EEGR 3253. Senior Design I. (W) (2) Prerequisites: EEGR 3111, 3132 with a grade of *C* or better. Corequisite: senior standing in engineering. A project-oriented course stressing the planning and design of experiments to support

the student's project. Formation of the design problem and specifications. *(Fall)*

EEGR 3254. Senior Design II. (W) (3) Prerequisite: EEGR 3253 with a grade of *C* or better. A continuation of EEGR 3253 consisting of project development and analysis, culminating in a written and oral presentation. *(Spring)*

EEGR 3695. Electrical Engineering Cooperative Education Seminar. (1) Required of Co-op students during semesters immediately following each work assignment for presentation of engineering reports on work done the prior semester. *(Fall, Spring, Summer)*

EEGR 3890. Individualized Study. (1-3) Prerequisite: consent of the department. Supervised individual study within an area of a student's particular interest which is beyond the scope of existing courses. May be repeated for credit. *(On demand)*

EEGR 3990. Undergraduate Research. (1-4) Prerequisite: consent of the department. This course involves the independent study of theoretical and/or experimental problems in the specialized area of engineering analysis and design. The student can pursue some particular area or problem to a depth much greater than can be undertaken within the scope of existing courses. May be repeated for credit. *(On demand)*

Undergraduate/Available for Graduate Credit

Additional work required for graduate credit.

EEGR 4111. Control Systems Theory I. (3) (3G) Prerequisite: EEGR 3111 with a grade of *C* or better. Transfer functions, block diagrams and signal flow graphs. Feedback control system characteristics. The performance and stability of feedback systems using root locus and frequency response methods. Time domain analysis of control systems. The design and compensation of control systems. *(Fall)*

EEGR 4112. Control Systems Theory II. (3) (3G) Prerequisite: EEGR 4111 with a grade of *C* or better. State space techniques and useful state space methods. System stability. Controllability and observability of linear systems. The formulation of the state equations for discrete-time systems and the analysis of these systems by matrices. Analysis of nonlinear systems. Optimal control systems studies. *(Spring)*

EEGR 4113. Modeling and Analysis of Dynamic Systems. (3) (3G) Prerequisite: EEGR 3111 or permission of the department. Models and dynamical properties of mechanical, thermal, and fluid systems, utilizing by analogy the properties of electrical circuit theory. Emphasis on the formulation of circuit models and the development of terminal equations of system components. Dynamic response to step, pulse, and sinusoidal driving functions using Laplace transforms. Sinusoidal steady-state and frequency response of systems. *(On demand)*

EEGR 4114. Topological Aspects of Circuit Theory. (3) (3G) Prerequisite: EEGR 3112 or permission of the department. Topological analysis of passive and active networks. Application of topology to switching network. Flow graph techniques in systems analysis. Topological synthesis and other applications. *(On demand)*

EEGR 4121. Antennas. (3) (3G) Prerequisite: EEGR 3122 with a grade of *C* or better or permission of the department. Radiation into free space, the point source, thin linear antenna, arrays of linear elements, aperture antennas, impedance, methods of feeding, matching and termination. Antenna systems. *(Fall)*

EEGR 4122. Acoustics. (3) (3G) Prerequisite: EEGR 3122 or PHYS 4231. Vibrations and simple vibrating systems; radiating systems; plane waves of sound; dynamic analogies, microphones and other acoustic transducers; acoustic measurements. *(On demand)*

EEGR 4123. Analog and Digital Communication. (3) (3G) Prerequisite: EEGR 3112. Analysis and transmission of signals including analog communication systems (amplitude and frequency modulation, effect of noise); digital communications systems (pulse code modulation, data transmission systems phase-shift keying and frequency-shift keying, effect of noise), *(Fall) (Evenings)*

EEGR 4124. Digital Signal Processing. (3) (3G) Prerequisite: EEGR 3111 with a grade of C or better. Overview of sampling and signal recovery in linear systems; analysis of sampled systems; discrete and fast Fourier transforms; design of analog lowpass, bandpass and highpass filters; design of digital FIR and IIR filters; implementation of general purpose digital signal processors. Graduate students will complete additional work that includes filter design and FFT algorithms using 'matlab' software, and special practical system design problems. (Spring)

EEGR 4125. Fundamentals of Optical Engineering. (3) (3G) Prerequisites: EEGR 3122 and PHYS 2241 or permission of the department. The engineering aspects and applications of modern optics. Optical communications, optical signal and data processing, principles of integrated optics. Fiber optical communications. Fast-Fourier transforms and diffraction theory applied to computed holography, computer tomography and optical processing. *(On demand)*

EEGR 4131. Linear Integrated Electronics. (3) (3G) Prerequisite: EEGR 3132 with a grade of *C* or better. Design of linear integrated circuits utilizing bipolar and MOS devices. Application in linear amplifier design, control and processing of analog signals. Power supply regulators, analog switches, and active filters. *(Fall)*

EEGR 4133. Solid State Microelectronics I. (3) (3G) Prerequisites: Physics 2101, EEGR 3121, each with a grade of C or better. Solid state microelectronics devices and components, MOS capacitors, ohmic and Schottky contacts, transport properties, Fermi statistics, space charged properties, oxide interface properties minority carrier generation and recombination and bulk and surface defect properties. *(Fall)*

EEGR 4134. Solid State Microelectronics II (3) (3G) Prerequisites: EEGR 3122 and 4133 each with a grade of *C* or better. Advanced device concepts for MOSFET, bipolar, and CMOS integrated circuits. Gate length, transit time, and power-frequency limits. Device scaling concepts. Tunneling and avalanche devices, and hot electron behavior. Device and interconnect reliability and failure and device

interconnects. Submicron channel, MODFET, and quantum well devices. High frequency solid state devices. Limits of switching speed. Solid state power devices. *(Spring)*

EEGR 4141. Power System Analysis I. (3) (3G) Prerequisite: EEGR 3142 with a grade of *C* or better. Representation of power system components for analysis studies. Transmission line parameters. Network equations. Load flow analysis and numerical methods. *(Fall)*

EEGR 4142. Power System Analysis II. (3) (3G) Prerequisite: EEGR 4141 with a grade of *C* or better. Economic operation of power systems. Short circuit studies. Symmetrical components. Transient stability analysis. *(Spring)*

EEGR 4143. Electrical Machinery. (3) (3G) Prerequisite: EEGR 3142 with a grade of *C* or better. Advanced theory of transformers and rotating. Machines; harmonic and saturation effects on machine performance. Unbalanced operation and transient conditions. *(On demand)*

EEGR 4161. Introduction To Robotics. (3) (3G) Prerequisites: EEGR 2103 or MEGR 2101 and senior standing. Modeling of industrial robots including homogeneous transformations, kinematics, velocities, static forces, dynamics, computer animation of dynamic models, motion trajectory planning, and introduction to vision, sensors and actuators (dual-listed with MEGR 4127). *(Fall)*

EEGR 4182. Digital System Testing. (3) (3G) Prerequisite: EEGR 2181 with a grade of *C* or better or permission of department. System testing; Boolean difference; D-algorithm; checking experiments; redundancy, computer-aided digital test systems. *(Spring)*

Graduate and Advanced Undergraduate

The 5000-level courses are first-year graduate courses although some advanced seniors may enroll with permission of the department.

EEGR 5090. Special Topics. (1-6) (1-6G) Directed study of current topics of special interest. May be repeated for credit. *(On demand)*

EEGR 5101. Advanced Computer Utilization. (3) (3G) Prerequisite: consent of department. The use of computers in large scale engineering problems. Topics include flow diagrams, matrix analysis of systems, applications of iteration methods to non-linear problems, eigen-value problems, optimization and handling of large engineering database problems. Engineering applications will be emphasized. *(On demand)*

EEGR 5102. Engineering Simulation. (3) (3G) Prerequisite: EEGR 2103 or consent of department. A wide range of simulation related topics will be introduced including the theory of simulation, characteristics of simulators, and trade-offs in simulation studies. Continuous and discrete simulation with primary emphasis on application of simulation techniques to engineering problems. Simulation of actual problems based on students' interest and experience areas. *(On demand)*

EEGR 5103. Applied Computer Graphics. (3) (3G) Prerequisite: permission of department. Interactive graphics; raster, character, vector, graphics, display technologies; rotation, scaling, translating of graphics image; image processing/enhancement; feature extraction; 3-D graphics; hidden lines. *(On demand)*

EEGR 5104. Computational Methods in Power Systems. (3) (3G) Prerequisite: EEGR 4142 or consent of department. Numerical techniques for analysis, operation and planning of power systems. Sparse matrix techniques applied to power flow algorithms. Economic operation of power systems. Optimum power flow. *(On demand)*

EEGR 5111. Control Systems. (3) (3G) Prerequisite: consent of department. Mathematical models and characteristics of control systems. Performance and stability of linear feedback systems. Root locus and frequency response techniques. Stability in frequency domain. Time domain analysis. Design and compensation of control systems. Credit will not be given for EEGR 5111 where credit has been given for EEGR 4111. *(Fall) (Evenings)*

EEGR 5112. Nonlinear Analysis. (3) (3G) Prerequisite: EEGR 3111. Solution of nonlinear problems using numerical and graphical methods, phase plane plots, analysis of singular points and analytical techniques. Forced oscillating systems. Stability of nonlinear systems. Use of analog and digital computer to study nonlinear problems. *(On demand)*

EEGR 5113. Network Synthesis. (3) (3G) Prerequisite: EEGR 4114. The positive real concept, properties and methods of testing. Realizability conditions on driving point functions. Methods of synthesis of one-port. Physical realizability and properties of two-port networks. Transfer function synthesis. Approximation methods. *(On demand)*

EEGR 5114. Device Characterization, Parameterization and Modeling. (3) (3G) Prerequisite: EEGR 3132 and ESGR 4134 or permission of department. Advance device and circuit analysis; device and circuit simulation using SPICE, ECAP or equivalent. Parametric modeling of active devices. Device characterization and parameterization; temperature effects; thermal cycling. Analysis of device failure modes. *(On demand)*

EEGR 5122. Random Processes and Optimum Filtering. (3) (3G) Prerequisites: EEGR 3111 and STAT 3122 or permission of department. Review of probability, univariate and multivariate distribution functions; random processes, discrete and continuous time precesses, widesense stationary, ergodicity; time-and frequency-domain analysis; linear systems, optimum filtering, Wiener filters, Kalman filters; application. (Spring)

EEGR 5123. Advanced Electromagnetic Field Theory. (3) (3G) Prerequisite: EEGR 3122 or permission of department. Maxwell's equations and propagation. Properties of guided and surface waves. Wave properties of light; physical and fiber optics. *(On demand)*

EEGR 5125. Optoelectronics. (3) (3G) Prerequisites: EEGR 3122 and PHYS 2241 or permission of department. The engineering aspects and applications of modern optics. Optical communications, optical signal and data processing, principles of integrated optics. Fiber optical

communications. Fast-Fourier transforms and diffraction theory applied to computed holography, computed tomography, and optical processing. *(On demand)*

EEGR 5132. Integrated Circuit Electronics. (3) (3G) Prerequisite: consent of department. Topics include analogy amplifier design, layout and simulation of analog circuits, active filters, analog processing, process control, electronic power supplies, reliability, noise and low-level signal processing. *(On demand)*

EEGR 5133. VLSI Systems Design. (3) (3G) Prerequisite: EEGR 2181 and 3131 or permission of department. Techniques for analysis, design, and synthesis of very large scale integrated circuits. A project-oriented course relying heavily on computer-aided design tools for logic, layout design, and simulation. *(Fall) (Evenings)*

EEGR 5134. Advanced VLSI Systems Design. (3) (3G) Prerequisite: EEGR 5133. A project-oriented course dealing with advanced topics in VLSI systems design and analysis such as circuit design techniques, array structures, performance estimation, automated routing and device electronics. *(Spring)*

EEGR 5135. Physical Electronics. (3) (3G) Prerequisite: EEGR 3122 or PHYS 3181 or permission of department. Dynamics of charged particles; electron motion in electromagnetic fields; types of electron emission; beam focusing; longitudinal and transverse beam waves; microwave generation; plasma parameters. *(On demand)*

EEGR 5137. Device Electronics for Integrated Circuits. (3) (3G) Prerequisites: EEGR 3132 and ESGR 4134, or permission of department. The basic operating principles of electronic devices in integrated circuits are treated. The physical models of these devices are discussed. Graduate students are required to carry out laboratory experimentation. *(Fall) (Evenings)*

EEGR 5138. Electronic Thin Film Materials and Devices. (3) (3G) Prerequisite: EEGR 4133 or 3132, or permission of the department. Applications of thin films in microelectronics/optoelectronics manufacturing processes; vacuum technology, deposition techniques, and the characterization methods relevant to optoelectronic applications; thin film applications such as metallization, silicide formation, light emitting diodes (LED) and lasers, and doping of semiconductors. *(Fall)*

EEGR 5139. Digital Communication Systems. (3) (3G) Prerequisites: EEGR 2181 and 3131. Topics include digital data transmission systems, signal and system representation, digital system performance characterization, pulse code modulation, and statistical communications theory. *(On demand)*

EEGR 5140. Introduction to VLSI Processing. (3) (3G) Prerequisite: permission of the department. Microelectronic fabrication; relevant materials, processes, and tools; fabrication of a simple structure in the VLSI clean room/lab. *(Fall)*

EEGR 5141. Unsymmetrical Analysis of Power Systems. (3) (3G) Prerequisite: EEGR 4142 or consent of department. Application of symmetrical components to the calculation of overcurrents and overvoltages during unsymmetrical faults. Characterization of generators, transformer banks and transmission lines for unsymmetrical analysis. Methods for grounding the system neutral. *(On demand)*

EEGR 5142. Power Generation: Operation and Control. (3) (3G) Prerequisite: EEGR 4142 or consent of department. Characteristics of power generation units, steam, nuclear reactor and hydroelectric. Economic and thermal system dispatch. Transmission losses, load flow problems. Hydro scheduling, hydro-plant models. Energy production cost models. Interchange evaluation. *(Fall) (Alternate years) (Evenings)*

EEGR 5143. Dynamic and Transient Analysis of Power Systems. (3) (3G) Prerequisite: EEGR 4142 or permission of department. Large-scale systems state descriptions and hierarchical control. State space models, dynamic stability and testing. Stability of simple and multi-machine systems. Transient phenomena in electrical power systems. Transient stability problem. *(Spring) (Alternate years) (Evenings)*

EEGR 5146. Introduction to VHDL. (3) (3G) Prerequisites: EEGR 2182 and knowledge of a computer language, or permission of department. Introduction to VHSIC Hardware Description Language (VHDL) including VHDL-based high-level design of microelectronic systems, VHDL programming, and VHDL synthesis; emphasis on learning and using industry-standard VHDL tools running on VNIX workstations. *(Fall)*

EEGR 5161. Control of Robotic Manipulators. (3) (3G) Prerequisites: EEGR 4161 and 4111. Control of industrial robots including linear, nonlinear, and adaptive control of robot's motion plus control of forces and torques exerted by the end-effector. Additional topics include computer animation of the controlled behavior of industrial robots, actuator and sensor types, robot vision, and control computer/robot interfacing (dual-listed with MEGR 5128). *(Spring)*

EEGR 5165. Laser Electronics. (3) (3G) Prerequisites: EEGR 3122 and PHYS 2241 or permission of department. Laser oscillation, excitation, amplification, dispersion, absorption, basic principles of quantum electronics, and general characteristics of lasers. Semiconductor lasers switching and modulation, photovoltaic and photodetectors. Ray tracing in an optical system, Gaussian beams in continuous media, and nonlinear optics, CW and pulsed lasers, Q-switching, mode locking, electrical and opto-electronic engineering aspects of laser technology. Basic spectroscopy, applications to semiconductor fabrication, and surface processing. *(On demand)*

EEGR 5181. Computer Arithmetic. (3) (3G) Prerequisite: permission of department. Principles, architecture and design of fast two operand adders, multi-operand adders, standard multipliers and dividers. Cellular array multipliers and dividers. Floating point processes, BCD and excess three adders, multipliers and dividers. *(On demand)*

EEGR 5187. Data Communications. (3) (3G) Prerequisite: consent of department. Principles of data communication; computer communications architecture

(layering) with emphasis on the physical layer and data link layer, transmission media; analog and digital signal representation; data transmission basics; Shannon's theorem; error detection/correction; data compression; point-to-point protocols; multiplexing. *(Fall)*

EEGR 5231. Materials for Electro-Optical Engineering. (3) (3G) Prerequisite: EEGR 4125 or permission of department. Methods of processing, growth, and device structuring for electro-optical and optical engineering; crystalline, polycrystalline, ceramic, glass, and polymer synthesid and processing to produce desire optical properties for magneto-optical devices and their use in electronic memories; synthesis, drawing, cladding, coupling, and dopling of optical fiber devices. *(Fall)*

EEGR 5261. Microwave Circuit Design I. (3) (3G) Prerequisites: EEGR 3131; and senior/graduate standing, or permission of department. Design and analysis of microwave devices and circuits; including microwave aspects of discrete active (i.e., field effect and bipolar transistors, etc.) and passive (i.e., microstrips, inductors, capacitors) components; device parameter extraction, using computer aided design (CAD) tools. *(Fall)*

EEGR 5265. Microwave Devices and Electronics. (3) (3G) Prerequisites: EEGR 3122 and PHYS 2231 with grades of *C* or better or permission of department. Microwave transmission line theory, parameters, microwave waveguides, microstrip line and components including resonators, slow-wave structures, tees, rings, couplers, circulators, isolators, and microwave tubes. Microwave solid state electronics including microwave transistors, tunnel diodes, transferred electron devices, avalanche transit-time devices, and mono-lattice microwave integrated circuits. *(On demand)*

EEGR 5892. Individualized Study. (1-6) (1-6G) Individual investigation and exposition of results. May be repeated for credit. *(On demand)*

Graduate Only

EEGR 6021. Advanced Topics in EM and Applications. (3G) Prerequisite: permission of department. Possible topics include: advanced boundary value problems; nonlinear magnetic materials; wave guides and resonant cavities; magnetohydrodynamics and plasmas; relativistic effects; charged particle dynamics; radiation. *(On demand)*

EEGR 6090. Special Topics. (1-6G) Directed study of current topics of special interest. May be repeated for credit. *(On demand)*

EEGR 6101. Advanced Computer Graphics. (3G) Prerequisites: EEGR 5103 and 5133 or permission of department. A project-oriented course using and developing techniques of CAD/CAM graphics, hardware and software development. Advanced application of graphics in computer-aided systems design. *(On demand)*

EEGR 6102. Optimization of Engineering Designs. (3G) Prerequisite: EEGR 5101 or consent of department. The development of computationally feasible algorithms for solving optimization problems in engineering designs. Introduction to non-linear programming methods; study of constrained and unconstrained problems, linear programming problems and other related topics. *(On demand)*

EEGR 6111. Systems Theory. (3G) Prerequisite: EEGR 4112 or consent of department. State space concepts and solutions. Introduction to theory of deterministic linear systems. Application of matrix methods and vector difference equations to lumped parameter electrical mechanical and fluid systems, and discrete time systems. Frequency domain techniques in signal and systems analysis. Computer simulation of system dynamics. *(Fall) (Evenings)*

EEGR 6112. Digital Control Systems. (3G) Prerequisites: EEGR 6111 and 4181 or consent of department. Time-domain and Z-domain analysis of linear discrete systems, open and closed loop sampled data systems, engineering characteristics of computer control systems, simulation of system dynamics. *(Spring) (Alternate years)*

EEGR 6114. Digital Signal Processing II. (3G) Prerequisite: permission of department. Discrete Hilbert Transforms, discrete random signals, effect of finite register length in digital and signal processing, speech processing, radar and other applications. *(Spring) (Alternate years) (Evenings)*

EEGR 6115. Optimal Control Theory I. (3G) Prerequisite: EEGR 6111 or permission of department. Optimum control of continuous-time and discrete time systems. The Maximum Principle and Hamilton Jacobi Theory. Theory of optimal regulator, state estimation and Kalman Bucy Filter. Combined estimation and control--the Linear Quadratic Gaussian Problems. Computational methods in optimum control systems. *(Fall) (Alternate years) (Evenings)*

EEGR 6116. Optimal Control Theory II. (3G) Prerequisite: EEGR 6115 or permission of department. A continuation of EEGR 6115 with emphasis on stochastic systems. Optimal filtering. Discrete-time Kalman filter and Kalman filter properties. Parameter identification. Multi-variable control systems, system sensitivity and robustness. *(Spring) (Alternate years) (Evenings)*

EEGR 6117. Applied Artificial Intelligence. (3G) Prerequisites: EEGR 6111 and CSCI 5150. Problem of creating intelligent behavior in machines, emphasizing computer-oriented approaches; practical applications such as machine aids to human problem-solving and computer control of external manipulators; current developments. *(On demand)*

EEGR 6118. Applied Digital Image Processing. (3G) Cross-listed with CSCI 6134. Digital image fundamentals; comparison of image transforms including Fourier, Walsh, Hadamard and Cosine; image data compression techniques; image enhancement algorithms; image restoration; image encoding process; image segmentation and description; relationship of hardware restrictions to image fidelity. *(On demand)*

EEGR 6121. Advanced Theory of Communications I. (3G) Prerequisite: introductory probability course or permission of department. Statistical communications theory and modern communications systems emphasizing modulation and methods of taking into account the effects of noise on various systems. *(Fall) (Alternate years) (Evenings)*

EEGR 6122. Advanced Theory of Communications II. (3G) Prerequisite: EEGR 6121 or permission of department. Continuation of EEGR 6121 including coding and decoding methods. Wave form communications. Applications. *(Spring) (Alternate years) (Evenings)*

EEGR 6125. Optoelectronic Information Processing. (3G) Prerequisite: EEGR 5125 with a grade of *B* or better or permission of department. Spatial light modulation including magneto-optic and electro-optic light modulators, optical bistable devices and logic gates, optical processing components such as array detectors and Charge Couple Devices (CCD), multiple-value logic, systolic processors and optical logic arrays, symbolic computing, optical interconnects, holographic elements and artificial intelligence, optical implementation of neural computers. *(Spring)*

EEGR 6127. Medical Ultrasonics. (3G) Prerequisite: EEGR 3122 or PHYS 4231 with grade of C or better, or permission of department. Acoustic wave propagation in fluids and solids, acoustic impedances, acoustic radiators and beam profiles; piezoelectricity, piezoelectric ceramics and polymers, integrated ultrasound transducers, design and testing of medical ultrasound transducers; hyperthermia, imaging, tissue characterization. *(Spring)*

EEGR 6131. Hybrid Microelectronics. (3G) Prerequisite: EEGR 5132 or permission of department. A project-oriented course involving design, bonding, interconnect and testing of a multidie hybrid microelectronics circuit. Emphasis placed upon use of I.C.'s of various technologies in these designs to optimize performance. *(On demand)*

EEGR 6132. Advanced Semiconductor Device Physics. (3G) Prerequisite: EEGR 5137 or permission of department. A review of semiconductor physics, bipolar and unipolar devices, photonic devices and methods of measuring specific device characteristics. *(Spring)*

EEGR 6133. MOS Physics and Technology. (3G) Prerequisite: EEGR 6132 or permission of the instructor. The theoretical and practical aspects of the metal oxide semiconductor (MOS) system, its electrical properties, and the measurement and the technology for their control. These topics are developed from simple beginnings to the current state of the art. *(Fall)*

EEGR 6138. Physical Design of VSLI Systems. (3G) Prerequisite: EEGR 5133 or equivalent. Synthesis and design of high-speed VLSI circuits; state-of-the-art approaches for circuit simulation; models and techniques for VLSI physical design. *(Spring)*

EEGR 6141. Power System Relaying. (3G) Prerequisite: EEGR 5141 or permission of department. Function and principles of protective relaying instrument transformers. Directional, distance and differential relays. Protection of generators, transformers, and transmission lines. Ground fault protection. Computer relaying, algorithms for protective relaying. (*On demand*)

EEGR 6142. Voltage Transients and Surge Protection. (3G) Prerequisite: EEGR 5141 or permission of department. Overvoltages due to lightning and switching surges. Traveling waves on transmission lines. Surge arrestors, insulation coordination. Surge protection of transmission lines, substations and rotating machine. Shielding and grounding. *(On demand)*

EEGR 6143. Power System Control. (3G) Prerequisites: EEGR 4142 and 4111 or permission of department. Computer functions for automatic control of power systems. Automatic generation control, regulation of frequency and tie-line power interchanges. Automatic voltage regulation, excitation system model. Power system dynamics. Computer control centers. *(On demand)*

EEGR 6146. Advanced VHDL. (3G) Prerequisite: EEGR 5146 or permission of department. Continuation of EEGR 5146. FPGA design with VHDL; VHDL modeling libraries and techniques, and VHDL coding methodology for efficient synthesid. *(Spring)*

EEGR 6151. Advanced Microelectronics Projects. (3G) Prerequisite: EEGR 5133. Project-oriented course for the advanced microelectronics student to pursue the testing and simulation at various levels (component, gate, cell and system), as well as the design of a significant VLSI implementation. *(On demand)*

EEGR 6156. Application Specific Integrated Circuit Design. (3G) Prerequisite: EEGR 5133 or permission of the department. Basic concepts, techniques and CAD tools in Application Specific IC Designs (ASIC); technology of ASIC circuits, method of design, CAD tools, and simulation and verification; practical aspects of design. *(Fall)*

EEGR 6171. Simulation of Electronic Materials. (3G) Prerequisites: PHYS 6142/EEGR 6162 and PHYS 4271/EEGR 4171. Tight-binding theory of periodic solids; bond orbital theory applied the linear and non-linear opticall properties of insulators and semiconductors; calculation of vibrational spectra; Green's Function methods for amorphous solids. Simulation of electrically active defeats in solids. *(On demand)*

EEGR 6183. Multiprocessor Systems Design. (3G) Prerequisites: EEGR 3184 and 5131. Topics include applications of multiprocessors to digital systems design; hardware/software tradeoff considerations; master/slave, multiple/master and loosely coupled systems; data handling and synchronization problems, networking. *(On demand)*

EEGR 6184. Computer System Engineering. (3G) Prerequisite: consent of department. Topics include data formats, register transfer operations, computer organization, microprogram control and ALU design. Arithmetic algorithms, I/O organization and memory

organization are also covered. Specific emphasis is placed throughout on tradeoffs between hardware and software. *(On demand)*

EEGR 6185. Advanced Microprocessor-Based Design. (3G) Prerequisite: CSCI 4181 or permission of department. An advanced course in computer design utilizing 16-bit micro processors. Architecture, software, and interface techniques. This course is project-oriented, involving the use of a logic analyzer. *(Fall) (Evenings)*

EEGR 6186. Design for Testability. (3G) Prerequisite: EEGR 2181 or permission of department. Fault modeling; test generation using the D-algorithm, PODEM, and FAN; partitioning; scan design, built-in self-testing; testing of array logic; and fault tolerance. Project-oriented course involving the use of logic and fault simulation tools. *(Spring) (Evenings)*

EEGR 6187. Modeling and Analysis of Communication Networks. (3G) Prerequisite: Probability theory or consent of the department. Communication networks; application of analytical tools for modeling and performance evaluation of these networks, including stochastic processes, Markov models, queuing theory, and teletraffic theory. *(Spring)*

EEGR 6261. Microwave Circuit Design II. (3G) Prerequisite: EEGR 5261, or permission of the department. Design/analysis of: (1) microwave low-noise, (2) power amplifier and (3) up/down converter circuits; circuit design examples from cellular and Personal Communications Systems (PCS); microwave and mm-wave circuit techniques. *(Spring)*

EEGR 6890. Individualized Study and Projects. (1-6G) Individual investigation and exposition of results. May be repeated for credit. *(On demand)*

EEGR 6991. Graduate Thesis Research. (0-6G) Individual investigation culminating in the preparation and presentation of a thesis. May be repeated for credit. *(On demand)*

EEGR 8999. Doctoral Dissertation Research. (0-9G) Individual investigation culminating in the preparation and presentation of a doctoral dissertation. *(On demand)*

EDUCATION INSTRUCTIONAL SYSTEMS TECHNOLOGY (EIST)

Undergraduate/Available for Graduate Credit

EIST 4100. Computer Applications in Education. (3) (3G) Computer systems and software for enhancing teaching, learning, and educational management; evaluating, selecting and integrating courseware into elementary, secondary, and higher education; principles of programmed learning and instructional design as they relate to technology-based interactive instruction. *(Fall, Spring, Summer)*

EIST 4135. Audiovisual Communications. (3) (3G) Prerequisite: Junior standing or departmental approval. Overview of traditional and emerging audiovisual media for education, training, marketing, and public relations, emphasizing knowledge and skills for evaluating, designing, producing, and using media such as photography, television, displays, interactive video, and microcomputers to enhance communication. *(On demand)*

EIST 4140. Educational Television. (3) (3G) Prerequisite: Junior standing or departmental approval. An examination of traditional and emerging applications of telecommunications media for teaching, training and informing. Investigation of published research and current strategies for evaluating the social and educational impact of television. Students will evaluate, design, produce, and utilize telecommunications media in micro-teaching settings, for the enhancement of communication in their respective disciplines. *(On demand)*

Graduate Only

EIST 6000. Topics in Instructional Systems Technology. (1-6G) May include classroom and/or clinic experiences in the content area. With department approval, may be repeated for credit for different topics. *(Fall, Spring, Summer)*

EIST 6100. Reading in Instructional Systems Technology. (3G) Contemporary issues and trends in instructional systems technology, including foundations in learning research, instructional systems design, requirements for instruction, task and needs analysis, learning situations and instructional models, learner characteristics, hardware and software innovations, assessing instructional outcomes, and factors affecting utilization. *(Fall)*

EIST 6110. Instructional Design. (3G) Prerequisites: EDUC 6100 and RSCH 6101. Advanced instructional design; systems development; task analysis; sequencing and delivery systems. *(Fall, Spring)*

EIST 6121. Instructional Courseware Authoring. (3G) Planning and developing instructional computer courseware using an authoring system to produce courseware that has application in the learning environment. *(Spring)*

EIST 6130. Instructional Development. (6G) Using design team roles of instructional designer, evaluator, technical writer, media support person, and project manager, students will develop an instructional materials package (module) to meet an identified need. *(Fall)*

EIST 6135. Learning Media, Resources and Technology. (3G) Selection, use and evaluation of technological innovations in instructional media. *(Fall, Spring)*

EIST 6491. Internship and Seminar in Instructional Systems Technology. (6G) Application of knowledge and skills in instructional technology in a cooperating off campus setting. *(Spring)*

EIST 6800. Individual Study in Instructional Systems Technology. (1-1G) Prerequisite: Permission of the student's adviser. Independent study under the supervision

of an appropriate faculty member. May be repeated for credit. *(Fall, Spring, Summer)*

EIST 7999. Graduate Residence. (0G) Meet Graduate School requirement for continuous enrollment during completion of a capstone project or comprehensive examination. *(Fall, Spring)*

ENGINEERING TECHNOLOGY (CIET) (EGET) (ELET) (INET) (MEET) (MFET)

An Engineering Technology course may be used for elective or minor credit by a student in another major only with the prior approval of the student's major department and the department of Engineering Technology.

CIVIL ENGINEERING TECHNOLOGY (CIET)

Undergraduate

CIET 3111. Structural Analysis I. (3) Prerequisite: elementary courses in statics and strength of materials. Basic concepts and principles of structural analysis relating to beams, trusses and frame structures. Analysis of statically determinate structures under fixed and moving loads, influence lines for moving loads. Approximate analysis of indeterminate structures. Emphasis on practical aspects of structural analysis. *(Fall, Spring)*

CIET 3112. Structural Analysis II. (3) Prerequisite: CIET 3111. Deflection of structures. Analysis of statically indeterminate structures using the methods of three-moments, consistent distortions, slope deflection and moment-distribution. An introduction to matrix methods of structural analysis. *(Spring, Summer)*

CIET 3121. Foundations and Earthwork. (3) Study of basic design and construction of foundations. Background theories are generally introduced in concise forms as formulas or charts. Emphasis on practical aspects of foundation design and earthwork construction. *(Fall)*

CIET 3132. Hydraulics. (3) A study of the fundamental principles of hydraulics and their applications in engineering practice, including the fundamentals of fluid flow through orifices, tubes and pipes, in open channels, and over weirs. *(Spring)*

CIET 3150. Hydraulics and Materials Laboratory. (W) (1) Laboratory designed to provide the student with: (1) An understanding of apparatus, techniques and procedures used to measure hydraulic flow, pressure, and head loss in open and closed conduits. Verification of some of the principles of hydraulics relating to fluid flow through Venturi meters, orifices, tubes and closed conduits, in open channels and over weirs; (2) An understanding of the apparatus, techniques, procedures, and test standards used to test construction materials. Three laboratory hours per week. *(Fall, Spring)*

CIET 3151. Soil Testing Laboratory. (W) (1) Prerequisite or corequisite: CIET 3121. A laboratory that is designed to familiarize the student with the common laboratory soil tests and analysis procedures with emphasis on the significance of the various tests, the testing procedures and the detailed computations. Three laboratory hours per week. *(Fall)*

CIET 3154. Asphalt and Asphalt Mixtures Laboratory. (W) (1) Study of physical properties of asphalt, of aggregates and their combinations, principles and practice in the design, construction and control of asphalt mixtures; laboratory tests for asphalts, aggregates and mixture design including specimen preparation and stability evaluation. Three laboratory hours per week. *(Spring, Summer)*

CIET 3211. Reinforced Concrete Design. (3) Prerequisite or corequisite: CIET 3112. Design of rectangular beams, T-beams, columns, reinforced concrete floor systems and reinforced concrete footings, according to the ACI code. Quality control of concrete and structural inspection. *(Spring)*

CIET 3212. Structural Steel Design. (3) Prerequisite: CIET 3112. Design of beams and columns, floor framing, tension and compression members, bolted and welded connections, according to AISC specifications. *(Fall)*

CIET 3213. Wood Structural Technology. (3) Prerequisite: CIET 3111. Design of floors, beams, columns and trusses of both solid and glued laminated wood; includes wood joints and concrete forms. *(On demand)*

CIET 3241. Highway Design and Construction. (3) Introduction to highway planning, economic considerations and traffic engineering. Design and construction of modern highways including grade separations and interchanges. *(Spring)*

CIET 3242. Pavement Design. (3) Prerequisite: CIET 3241. Study of stresses in flexible and rigid pavements, and properties of pavement components. Design of rigid and flexible pavements. Discussion of pavement performance and failures and of pavement strengthening. *(On demand)*

CIET 3243. Project Management Technology. (3) Use of CPM and other network analysis methods for planning, managing and controlling projects. *(Fall)*

CIET 3252. Environmental Laboratory. (W) (1) Prerequisite or corequisite: CIET 3262. Laboratory on the analysis of water and sewage and problems related to environmental control. Three laboratory hours per week. *(On demand)*

CIET 3253. Construction Engineering Technology Field Laboratory. (W) (1) Prerequisite: senior standing. A synthesis of prior work, using fundamental principles as applied in a directed project. Three laboratory hours per week. *(On demand)*

CIET 3262. Introduction to Environmental Engineering Technology. (3) Prerequisite: CIET 3132. Study of water supply, treatment and distribution and liquid-waste disposal systems. *(Fall)*

CIET 3281. Cost Estimating I. (3) Methods used to estimate costs of construction activities. Develops the methods and procedures for preparing quantity surveys and to estimate labor and equipment requirements. *(Fall)*

CIET 3282. Cost Estimating II. (3) Prerequisite: CIET 3281. Estimating techniques applied to project work. Topics

include subcontractors, plant and overhead costs, profit and bidding. *(On demand)*

CIET 3293. Building Systems. (3) Basic theory and practical application of heating, ventilation, air conditioning, plumbing and electrical systems in construction. Study of National Fire and Plumbing Codes. *(Spring)*

ENGINEERING TECHNOLOGY (EGET)

Undergraduate

EGET 3000. Special Topics in Engineering Technology. (1-4) Prerequisite: senior standing in Engineering Technology or consent of the department. Examination of specific new areas which are emerging in the various fields of engineering technology. The course builds upon the knowledge the students have gained from their engineering technology curriculum. May be repeated for credit. *(On demand)*

EGET 3171. Engineering Analysis I. (P) (3) Prerequisites: differential and integral calculus. Methods of solving engineering problems which involve the differentiation and integration of algebraic, trigonometric and logarithmic functions; use of integral tables. *(Fall, Spring, Summer) (Evenings)*

EGET 3233. Computer Graphic Technology. (3) Study of computer graphics as a design drafting tool. Using computer driven plotters and digitizers to prepare engineering drawings and illustrations. *(On demand)*

EGET 3273. Engineering Analysis III. (P) (3) Prerequisite: EGET 3171 and a course in programming using a higher level language. Elementary numerical methods for the solution of engineering problems on the digital computer. Emphasis on applications to civil and mechanical engineering technology, using both commercial and student written programs. *(Fall)*

EGET 3695. Engineering Technology Practicum Seminar. (1) Prerequisite: MFET 3490 or ENGR 3590. Required during the semester immediately following each work assignment for students enrolled in either MFET 3490 or ENGR 3590; for presentation of engineering reports (verbal and oral) on work done the prior semester. May be repeated for credit. *(Fall, Spring, Summer)*

ELEMENTARY EDUCATION (ELED)

Undergraduate

ELED 3120. The Elementary School Child. (3) Prerequisite: Admission to Teacher Education. Child development theories and research findings, conceptual relationships between education and developmental paradigms, pathways of individual student development, child-centered and other types of educational reforms, the concept of developmental "needs" and the roles and responsibilities of school staff for meeting children's developmental needs. Includes approximately 10 hours of field activities. *(Fall, Spring, Summer)*

ELED 3121. Measuring and Evaluating Learning in the Elementary School Curriculum. (3) Prerequisite: Admission to Teacher Education. Planning for K-6 classroom measurement and evaluation based on objectives with emphasis on writing cognitive, affective and psychomotor outcomes using an accepted system, and the development of teacher-made tests and other types of classroom assessment including objectives, essay, oral, performance, and portfolio evaluation. Includes 5 hours of field experiences. *(Fall, Spring, Summer)*

ELED 3122. Research and Analysis of Teaching Elementary School Learners. (3) Prerequisite: Admission to Teacher Education. Concepts, methods, and practices used by effective teachers in their daily K-6 classroom routines with emphasis on classroom management and organization. Approximately 10 hours of field experience. *(Fall, Spring, Summer)*

ELED 3220. Integrating Curriculum for Elementary School Learners. (4) Prerequisite: Admission to Teacher Education. Curriculum planning and development skills with emphasis on relating school content and skills to societal and individual needs, designing and implementing integrated activities, and attending to the nature and functions of elementary schools. Includes 12 hours of field experiences. *(Fall, Spring, Summer)*

ELED 3221. Teaching Science to Elementary School Learners. (3) Prerequisite: Admission to Teacher Education. Teaching strategies and materials appropriate for teaching inquiry science in grades K-6 with emphasis on using science process skills and content to develop effective science learning experiences for elementary school children. Includes 10 hours of field experiences. *(Fall, Spring, Summer)*

ELED 3223. Teaching Social Studies to Elementary School Learners. (3) Prerequisite: Admission to Teacher Education. Teaching strategies and materials for social studies in grades K-6 with emphasis on using social science content to develop effective social studies instructional plans for elementary school children. Includes 12 hours of field experiences in a classroom setting. *(Fall, Spring, Summer)*

ELED 3226. Teaching Language Arts to Elementary School Learners. (3) Prerequisite: Admission to Teacher Education. Teaching of language arts in grades K-6, including how the study of language acquisition and growth informs and guides instructional practice. Emphasis on methods for fostering growth in speaking, listening, writing, and reading across the curriculum. Includes 12 hours of field experiences. *(Fall, Spring, Summer)*

ELED 3420. Student Teaching/Seminar: K-6 Elementary Education. (15) Prerequisites: Completion of all other course work and approved Application for Student Teaching. Planned sequence of experiences in the student's area of specialization conducted in an approved school setting under supervision and coordination of a university supervisor and a cooperating teacher. Students must demonstrate the competencies identified for their specific teaching field in an appropriate grade-level setting. Approximately 35 to 40 hours per week in an assigned school setting and 10-12 on-campus seminars scheduled throughout the semester. *(Fall, Spring)*

ELED 3800. Individual Study in Elementary Education. (1-6) Prerequisite: Permission of the student's adviser. Independent study under the supervision of an appropriate faculty member. May be repeated for credit. *(Fall, Spring, Summer)*

ELED 5000. Topics in Elementary Education. (1-6) (1-6G) May include classroom and/or clinical experiences in the content area. With department approval, may be repeated for credit for different topics. *(Fall, Spring, Summer)*

Graduate Only
ELED 6000. Topics in Elementary Education. (1-6G) May include classroom and/or clinic experiences in the content area. With department approval, may be repeated for credit for different topics. *(Fall, Spring, Summer)*

ELED 6221. Teaching and Learning K-6 Science. (3G) Prerequisites: Core requirements. Current trends and issues in teaching and learning science with emphasis on contemporary literature and classroom implementation. Field experiences and teaching experiences are individualized. *(Fall)*

ELED 6241. Teaching and Learning K-6 Social Studies. (3G) Prerequisite: Core requirements. Theory and research related to issues in social studies curriculum and instruction. Field experiences and teaching experiences are individualized. *(Spring)*

ELED 6251. Teaching and Learning Mathematics. (3G) Prerequisite: core requirements. Examination of the K-6 mathematics curriculum, including a critical analysis of research literature related to problem solving processes and mathematics learning. *(Yearly) (Evenings)*

ELED 6252. Teaching and Learning K-6 Mathematics. (3G) Examination of the mathematics curriculum, including a critical analysis of research literature related to problem-solving processes and mathematics learning. Field experiences and teaching experiences are individualized. *(Fall, Spring)*

ELED 6470. Elementary Education Clinical Experience. (3-6G) Prerequisite: Department approval. Program of experiential learning activities in an approved school setting (K-6). Departmental approval required. *(On demand)*

ELED 6474. Analysis of Teaching/Practicum: K-6 Elementary Education. (3G) Prerequisites: Core courses and permission of instructor. Development of the student's ability to observe, analyze and recommend changes for curriculum and instruction in the elementary classroom. Development of proposal for action research project. *(Fall, Spring)*

ELED 6800. Individual Study in Elementary Education. (1-6G) Prerequisite: Permission of the student's adviser. Independent study under the supervision of an appropriate faculty member. May be repeated for credit. *(Fall, Spring, Summer)*

ELED 6991. Research Project in Elementary Education. (3G) Prerequisites: Core and specialization requirements. Students conduct an approved action research project of their own design and origination under the supervision of graduate faculty members. An acceptable report, written in APA style, is required for successful completion of the course. May be repeated once for credit with approval of adviser and program coordinator. Pass/no credit grading. *(Fall, Spring)*

ELED 7999. Graduate Residence. (0G) Meets Graduate School requirement for continuous enrollment during completion of a capstone project or comprehensive examination. *(Fall, Spring)*

ELECTRICAL ENGINEERING TECHNOLOGY (ELET)

Undergraduate
ELET 3112. Semiconductors. (S) (3) Prerequisite or corequisite: ELET 3123. Atomic structure; properties of semiconductor materials; diodes, bipolar transistors; integrated circuit fabrication; field-effect transistors. *(Spring)*

ELET 3123. Analysis of Linear Networks I. (4) Prerequisite or corequisite: EGET 3171 or MATH 1121. Resistive circuits; current and voltage sources; Kirchoff's laws, network theorems, RC and RL circuits; waveform analysis and synthesis; time domain circuit analysis; 1st order natural and forced responses; Laplace Transform fundamentals. Circuit transformations. Intro to frequency domain circuit analysis. Application of PSPICE for circuit analysis. *(Fall, Spring)*

ELET 3124. Analysis of Linear Networks II. (4) Prerequisite: ELET 3123. Prerequisite or corequisite: EGET 3171. Circuit analysis utilizing network theorems & techniques in the frequency domain. 2nd order responses. Two port network analysis and transfer functions. Bode plots; transformers & filter applications; introduction to fourier analysis. Application of PSPICE for circuit analysis. *(Spring, Summer)*

ELET 3153. ELET Laboratory I. (W) (1) Prerequisites or corequisites: ELET 3123 and 3183. Experiments which support concepts and practice covered in ELET 3123 and 3183. Three laboratory hours per week. *(Fall)*

ELET 3156. ELET Laboratory II. (WS) (1) Prerequisites or corequisites: ELET 3112 and 3124. Experiments which support concepts and practice covered in ELET 3112 and 3124. Three laboratory hours per week. *(Spring)*

ELET 3183. Digital Logic Design. (3) Prerequisite: two-quarter course sequence in digital logic circuits. Design of combinational and sequential digital logic circuits. Minimization methods and state assignment techniques. Circuit implementation using MSI, LSI, and programmable circuits. Introduction to computer architecture. *(Fall)*

ELET 3211. Active Networks I. (3) Prerequisites: ELET 3112 and 3124. Rectifiers; amplifiers analysis; transistor biasing; small signal models; feedback amplifier analysis; amplifier frequency response. *(Fall)*

ELET 3212. Active Networks II. (3) Prerequisite: ELET 3211. Amplifier frequency response (continued); feedback amplifier frequency response; operational amplifiers and applications. *(Spring)*

ELET 3213. Industrial Electronics. (3) Prerequisite: ELET 3124. Prerequisite or corequisite: ELET 3211. Powerdiodes, bipolar power transistors, thyristors, power MOSFET's and their circuit applications to industrial problems. *(Fall)*

ELET 3214. Operational Amplifiers with Applications. (3) Prerequisite: ELET 3211. Idea OP-AMP analysis, practical OP-AMP considerations, linear OP-AMP circuits, nonlinear OP-AMP circuits, practical applications. *(Spring)*

ELET 3222. Automatic Controls. (3) Prerequisite or corequisite: ELET 3212. Automatic control concepts; mathematical models; control system components; transient and frequency response; control system design. *(Spring)*

ELET 3255. ELET Laboratory III. (W) (1) Prerequisites or corequisites: ELET 3211 and 3281. Experiments which support concepts and practice covered in ELET 3211 and 3281. Three laboratory hours per week. *(Fall)*

ELET 3256. ELET Laboratory IV. (W) (1) Prerequisites or corequisites: ELET 3212 and 3275. Experiments which support concepts and practice covered in ELET 3212 and 3275. Three laboratory hours per week. *(Spring)*

ELET 3257. ELET Laboratory III. (W) (1) Prerequisites or corequisites: ELET 3211 and 3213. Experiments which support concepts and practice covered in ELET 3211 and 3213. Three laboratory hours per week. *(Fall)*

ELET 3258. ELET Laboratory IV. (W) (1) Prerequisites or corequisites: ELET 3212, 3214, and 3222. Experiments which support concepts and practice covered in ELET 3212, 3214, 3222. Three laboratory hours per week. *(Spring)*

ELET 3261. Industrial Instrumentation. (3) Prerequisites: ELET 3112 and 3124. Pneumatic and electrical sensors and transducers used for measuring physical processes, such as temperature, pressure and flow rate; selection criteria; standards and calibration. *(On demand)*

ELET 3275. Integrated Circuit Applications. (3) Prerequisites: ELET 3112 and 3183. Study of the external characteristics of digital and analog integrated circuits. Applications of these circuits in digital systems. Design constraints and considerations due to device limitations. Device selection based upon application requirements. *(Spring)*

ELET 3281. Computer Design. (3) Prerequisite: ELET 3183. Prerequisite or corequisite: ELET 3285. Organization and design approaches for computer systems. Hardware-software relationships. Micro-programming. Arithmetic algorithms. Input-output design; multiprocessor systems and networks. *(Fall)*

ELET 3284. Design of Real-Time Systems. (3) Prerequisite: ELET 3285. Prerequisite or corequisite: ELET 3281. Characteristics and applications of real-time computer systems, especially as applied to process control, monitoring, and data collection; the computer as a part of the total system, programming for real-time applications; reliability and maintainability; effects of downtime. *(On demand)*

ELET 3285. Assembly-Language Programming. (3) Prerequisite or corequisite: ELET 3183. Programming methodology and assembly language programming for the MC68000 series microprocessors. *(Spring)*

ELET 3286. Microcomputer Applications. (3) Prerequisite: ELET 3281. Architecture, instruction set, and bus structure of representative microprocessors; assembly language programming; interfacing experi-ments. Two lecture hours and three laboratory hours per week. *(Spring)*

INDUSTRIAL ENGINEERING TECHNOLOGY (INET)

Undergraduate

INET 3103. Methods Analysis. (3) Analysis of work methods; a study of work measurement systems; regression techniques in formula construction; progress curves. *(On demand)*

INET 3123. Production Control Systems. (3) Prerequisite: statistics. Principles, analysis and design of production and inventory planning and control systems. Demand forecasting, production scheduling and control systems and introduction to CPM. *(On demand)*

INET 3133. Quality Control. (3) Principles and applications of quantitative methods of quality control to design and production processes. Introduction to design of experiments, process control charts, Pareto charts, and other quality analysis tools for both service and manufacturing industries. *(Spring)*

INET 3151. Method Analysis Laboratory. (W) (1) Prerequisite or corequisite: INET 3103. Analysis and design of work methods; principles of motion study; work measurement by direct and predetermined motion-time systems; video tape and motion picture analysis. *(On demand)*

INET 3203. Plant Layout. (3) Prerequisite: INET 3103. Designing a plant or office with respect to material handling, machine location, auxiliary services, capital requirements, safety and personnel organization. *(On demand)*

INET 3211. Directed Projects. (1) Prerequisite: senior standing. A synthesis of prior work using fundamental principles applied in a directed project. Design of production systems and subsystems. *(On demand)*

INET 3223. Engineering Economics. (3) Principles of evaluating alternative engineering proposals. Economic measures of effectiveness, costs and cost estimation, basic comparative models, breakeven and replacement analysis. *(Fall, Spring, Summer)*

INET 3233. Occupational Safety. (3) Causes and prevention of industrial accidents. Hazardous processes and material. Design of accident prevention programs. *(On demand)*

INET 3243. Occupational Health Technology. (3) Methodology and philosophy of evaluating and monitoring the work environment for human stresses and toxic substances which affect the health of the worker. Topics include gases, vapors, fumes and dust; radio-activity hazards; occupational diseases; thermal stress; illumination and exhaust ventilation. *(On demand)*

INET 3251. Plant Layout and Materials Handling Laboratory. (W) (1) Prerequisite or corequisite: INET 3203. Analysis and design of material handling systems; specifications of system components. *(Spring) (Evenings)*

INET 3263. Human Factors. (3) Human capabilities and limitations affecting communications and response in man-machine systems. Physiological and psychological fundamentals; anthropometrics. (*On demand*)

MECHANICAL ENGINEERING TECHNOLOGY (MEET)

Undergraduate

MEET 3113. Dynamics. (3) Prerequisites: statics, differential and integral calculus. The dynamic behavior of particles; translation, rotation and plane motion of a rigid body, the principles of conservation of energy and momentum. *(Spring)*

MEET 3123. Strength of Materials. (3) Prerequisites: statics, differential and integral calculus. Stress-strain relationships resulting from direct loads, torsional loads and bending loads, and the results obtained from applying more than one of these loads simultaneously. Beam deflection and column loading. *(Fall)*

MEET 3133. Fluid Mechanics. (3) Fundamental principles of fluid mechanics. Topics include manometry, buoyancy, forces on submerged bodies, boundary layers, flow over surfaces, Bernoulli's equation with applications, orifices, pipe losses and an introduction to hydrodynamics. *(Fall)*

MEET 3143. Thermodynamics. (3) Prerequisites or corequisites: differential and integral calculus. Fundamentals of thermodynamics including work and heat; classical approach to first and second laws of thermodynamics; ideal gas, entropy, reversibility, irreversibility, and study of various processes and cycles. *(Fall)*

MEET 3151. Fluid Mechanics Laboratory. (W) (1) Prerequisite or corequisite: MEET 3133. Flow through conduits and in open channels, the experimental determination of fluid specific weights, viscosity and flash and fire points. Flow measuring devices such as orifices, venturi tubes, anemometers and pitot tubes. Laminar-turbulent flow and stability. *(Spring) (Evenings)*

MEET 3152. Stress Analysis Laboratory. (W) (1) Prerequisite or corequisite: MEET 3123. Experiments illustrating stress-strain relationships in engineering materials and the use of brittle coating, photoelasticity and electrical-resistance strain gages. *(Fall)*

MEET 3163. Instrumentation and Controls. (3) Introduction to instrumentation for measurement and control of physical variables, with emphasis on electronic systems. Review of basic circuit analysis, electrical instruments, sensors and measurement principles and a survey of automatic controls from a systems point of view. *(Spring)*

MEET 3213. Machine Design I. (3) Prerequisite: MEET 3123. Prerequisite or corequisite: MEET 3113. Analysis and design of clutches, brakes, belts and roller chain. Indeterminate normal loading, superposition of stresses and deflections, compound stresses, columns and fatigue. Theories of failure. Shaft design, deflections of shafts with nonuniform moments of inertia involving computer verification. Antifriction bearings, engineering materials, helical compression springs. Small mechanical component and system designs. *(Fall)*

MEET 3223. Machine Design II. (3) Prerequisite: MEET 3213. A continuation of MEET 3213 with emphasis on new methods of problem solving and opportunities to integrate previously attained skills and knowledge into the design and optimization of small machine systems. (*On demand*)

MEET 3243. Senior Design Project. (3) Prerequisite: MEET 3113, 3133, 3143, 3213, and 3163. Students develop solutions to design problems requiring application of skills developed in mathematics and technical specialty courses. Design problem solutions are presented in both written form and to the class in oral presentations. May be repeated for credit. *(Fall, Spring)*

MEET 3251. Instrumentation Laboratory. (W) (1) Prerequisite or corequisite: MEET 3163. Practice in the use of the various instrumentation devices studied in MEET 3163. *(Fall) (Evenings)*

MEET 3252. Thermodynamics and Heat Transfer Laboratory. (W) (1) Prerequisite or corequisite: MEET 3143. Experimentation involving the fundamental principles of thermodynamics and heat transfer, as applied to internal combustion engines, steam engines, engine dynamometers, refrigeration and heat pumps, solar energy systems, and heat exchangers. Three laboratory hours per week. *(Fall)*

MEET 3263. Fluid Power. (3) Prerequisite: MEET 3133. Mechanical and fluid power and the conversion of one to the other. Components and system efficiencies including those consisting of cascaded components. Performance evaluation of such hydraulic components as pumps, motors, valves and metering devices. Viscosity, bulk modulus, noise, optimum performance and system design will be considered. *(On demand)*

MEET 3273. Air Conditioning Systems. (3) Prerequisite: MEET 3143. Functions and operating characteristics of the major components of refrigerating machines, heat pumps, boilers, furnaces, solar collectors, heat exchangers, fans and pumps. Emphasis on sizing, economics and performance characteristics. Includes coverage of psychometric principles and fan and pump laws. *(On demand)*

MEET 3283. Modern Techniques in Energy Conservation and Utilization. (3) Prerequisite: MEET 3143 or consent of the instructor. Survey of current topics that may include solar energy, basic nuclear reactor technology, ammonia-based Rankine cycle, absorption refrigeration cycle, heat pump cycle, techniques for energy conservation in new construction and techniques for retrofitting existing energy utilization systems. *(On demand)*

MANUFACTURING ENGINEERING TECHNOLOGY (MFET)

Undergraduate

MFET 3111. Manufacturing Processes. (3) Capabilities, limitations, and operating characteristics of families of machine tools and processes; casting, cutting, forming, joining, fabrication, and inspection machinery. (*Fall*)

MFET 3113. Fundamental of Optics. (3) Prerequisite: algebra, trigonometry, plane geometry, and physics. A phenomenological introduction to applied optics; interactions between light and materials; properties of light; lenses and mirrors; simple optical systems; interference and diffraction; introductions to optical fibers, lasers, and holography. (*Fall*)

MFET 3114. Thin Films and Optical Coatings. (3) Prerequisite: algebra, trigonometry, plane geometry, and physics. Vacuum technology, process controls, and special techniques used in the fabrication of thin films and the surfaces on which they are prepared; ways in which the optical tribological, and electronic industries utilize these structures in their products. (*Spring*)

MFET 3131. Computer Integrated Manufacturing (CIM). (3) Automated manufacturing systems involving computers to monitor vendor input, process variations, component selection and routing, and test and evaluation of products. Applications involving integration of computer aided design (CAD) systems with computer aided manufacturing (CAM) systems. (*Spring*)

MFET 3141. Industrial Applied Optical Systems. (3) Prerequisite: EGET 3171. The applications of electro-optical technology in manufacturing and industrial systems is investigated. The fundamentals of applied optics, laser theory and semi-conductor optical devices will be reviewed. (*On demand*)

MFET 3141L. Applied Optical Systems Laboratory. (1) Corequisite: MFET 3141. Applications of electro-optical technology in manufacturing systems. Laboratory experiments demonstrating the use of lasers in the following manufacturing and industrial applications will be performed: cutting, machining, welding, measurement, marking, and control of processes; machine vision systems, sorting, process control, and real-time quality control; bar code systems; optical character recognition; optical data transmission. (*On demand*)

MFET 3153. Optics Laboratory. (2) Prerequisite or corequisite: MFET 3113. Experiments designed to illustrate properties of light and optical systems; reflection and refraction; lenses and lens systems; optical instruments; interference and diffraction; polarized light; laser principles. (*Fall*)

MFET 3181. Digital Process Control. (3) Prerequisite: MEET 3164. Applications and programming of microprocessors and programmable controllers for control of manufacturing processes. Interfaces with sensors, actuators, and computer systems. Includes classroom and laboratory demonstrations. (*Spring*)

MFET 3211. Topics in Precision Manufacturing. (3) Senior seminar in selected areas of modern production of both conventional and micro-miniaturized products; surface mount technology for electronic components; manufacturing in the clean room environment; metrology; manufacture of micro-miniature mechanical systems; vacuum coating and plating systems; systems for automatic process control and product inspection. (*On demand*)

MFET 3221. Data Recording Technology. (3) Prerequisite: MFET 3141. Principles of operation of high speed, high capacity data recording systems used in industrial and commercial applications; magnetic disk and tape systems; CD-ROM systems; WORM (write once, real many) optical disk systems; TMO (thermo-magneto-optical) disk systems; and videodisks. Comparative analysis of systems and of manufacturing techniques used in their production. *(On demand)*

MFET 3232 and MFET 3242. Senior Design Project I and II. (2) (2) Prerequisites: senior standing or permission. A two semester course sequence in which each student conceives, proposes and implements a senior level design project which demonstrates abilities as developed by the coursework taken thus far. Each student uses industrial project planning techniques to complete a project proposal and plans and completes the project including design evaluation during the second semester. One class hour, three lab hours per week. Students must have an approved project before they are permitted to enroll in this course. (*Fall, Spring*)

MFET 3251. CIM Laboratory. (W) (2) Experiments with computer control of processes, including numerical control and robotics. Measurement of physical variables for monitoring, controlling, and testing production operations. Application of microprocessors and micro computers to system control and status reporting. One class hour, three lab hours per week. *(Spring)*

MFET 3252. Data Recording Technology Laboratory. (1) Prerequisite or corequisite: MFET 3221. Experiments using various magnetic and optical date recording systems to illustrate characteristics and principles of operation. Examination and test of media and drive systems, with attention to precision manufacturing and quality control considerations. Formal laboratory reports in simulated testing laboratory format. *(On demand)*

MFET 3490. Manufacturing Engineering Technology Practicum. (0) Directed individual study in a selected area of Manufacturing Engineering Technology exploring the practical applications and practices in industry or research. (*Fall, Spring, Summer*)

ENGLISH (ENGL)

Undergraduate

ENGL 1100. English As A Foreign Language. (3) Limited to students whose native language is not English who may need additional preparation before beginning the required first-year English composition courses. Does not count toward an English major nor toward the general education requirement. One may not register for ENGL 1100 before taking the English Department's placement test for persons whose primary language is not English. (*Fall, Spring*)

ENGL 1101. English Composition. (3) Extensive practice in and discussion of composition in various forms, for different purposes, and for various audiences. Students experience writing as a means of personal growth, intellectual development, and communication. (*Fall, Spring, Summer) (Evenings*)

ENGL 1102. Writing in the Academic Community. (3) Prerequisite: ENGL 1101. Writing argumentation appropriate to inquiry in an intellectual community. *(Fall, Spring, Summer) (Evenings)*

ENGL 1103. Accelerated College Writing and Rhetoric. (3) Prerequisite: Placement by English Department. Accelerated writing curriculum that fulfills the requirement for ENGL 1101 and 1102. *(Fall, Spring, Summer) (Evenings)*

ENGL 1101 and 1102 are prerequisites for all English courses at the 2000 level or above.

ENGL 2014. Topics in Writing. (W) (1-3) Offers instruction and practice in special types of writing, such as research or legal writing, which are not included in other writing courses. In addition, some sections may be designed for students who need strengthening of composition skills, or may offer instruction in various aspects of effective writing. English 2014 *may not be used* toward the requirements for the English major. The *maximum hours of credit* allowed are six for English 2014 or 2015, or for 2014 and 2015 together. (*On demand*)

ENGL 2015. Topics in Writing. (W) (1-3) Offers instruction and practice in special types of writing, such as writing for publication (exclusive of poetry, drama and fiction), which are not included in other writing courses. In addition, some sections may offer instruction in various aspects of effective writing. *Not more than* three hours of 2015 may be used toward the requirements for the English major (and those three hours may not be used toward fulfillment of the 12 hours of English language or composition required for licensure in English). The *maximum hours of credit* allowed for any student are six for English 2015 or 2014, or for 2015 and 2014 together. (*On demand*)

ENGL 2050. Topics in English. (3) Designed to offer topics of general interest not included in other courses. May be repeated for additional credit with the approval of the English Department. Does not count toward the English major. (*Yearly*)

ENGL 2090. Topics in English. (3) Designed to offer topics of general interest not included in other courses. May be repeated for additional credit with the approval of the English Department. May count toward the English major. (*On demand*)

ENGL 2101. Masterpieces of British Literature I. (L or C) (3) An introduction to British Literature written before 1800. The course also provides backgrounds in the society and culture of the Middle Ages, the Renaissance, and the Age of Reason. (*Fall*)

ENGL 2102. Masterpieces of British Literature II. (L or C) (3) An introduction to masterpieces of British Literature written since 1800. The course also provides backgrounds in the society and culture of the Romantic, Victorian and Modern periods. (*Spring*)

ENGL 2103. Masterpieces of Modern Fiction. (L) (3) Readings in selected novels and short stories written since 1850. (*Fall, Spring, Sumner) (Evenings*)

ENGL 2104. Major American Writers. (L) (3) Introductory readings in six to eight authors, approximately half from the 19th century and half from the 20th century, both poetry and prose. (*Yearly*)

ENGL 2105. Introduction to Poetry. (WL) (3) Representative poems and poets, drawn from several literary periods that introduce students to several poetic genres, to varied treatments of universal themes (such as love, death, disappointment, joy) and to various ideas about poetic imaginations. (*Yearly*)

ENGL 2106. Film Criticism. (A) (4) Introduction to film as an art form. Emphasis will be on critical theory and on critical analysis of the form and the content of different kinds of films--e.g., the narrative film, the silent film, the documentary film, etc.--drawn from the international cinema. Students will apply critical theory to the analysis of professionally made films and will have the option of making their own short films. A viewing lab is required. (*Fall, Spring*)

ENGL 2108. Introduction to Drama. (W) (3) Representative plays of the western world from the classical period to the modern period to introduce students to drama as literature, with consideration of staging, conventions of the theatre, types of drama, and dramatic theory. (*Alternate years*)

ENGL 2111. Masterpieces of World Literature I. (L or X) (3) Readings of Greek, Latin, and Eastern poetry and prose, in English translation. The genesis of literature in myth, in Eastern religion, and in the Bible, and the development of Greek and Roman literature. (*Fall*)

ENGL 2112. Masterpieces of World Literature II. (L or X) (3) Readings in Medieval, Renaissance and Modern European literature, in translation into English. Social and literary changes in the Reformation and Renaissance, the beginnings of new modes of thought in the Age of Enlightenment, and other scientific, literary, religious, philosophical and social changes up to the modern period. (*Spring*)

ENGL 2116. Introduction to Technical Communication. (W) (3) Technical Communication theory (such as organization, audience analysis, and editing) is taught in the context of oral and written formats, such as memoranda, proposals, and reports, and includes formats and content common to students' own disciplines. (*Fall, Spring*)

ENGL 2126. Introduction to Creative Writing. (W) (3) This course introduces students to creative writing, including both poetry and fiction writing, assuming little or no previous creative writing experience. (*Fall, Spring*)

ENGL 3050. Topics in English. (3) Special topics not included in other courses. May be repeated for credit as topics vary. *(Fall, Spring)*

ENGL 3100. Approaches to Literature. (3) Introductory study and application of major critical approaches to literature, such as historical, psychological, mythological and formalistic. Required of English majors and highly recommended as the first post freshman-level course for the English major. (*Fall, Spring*) (*Evenings*)

ENGL 3103. Children's Literature. (L) (3) Critical and historical study of children's literature, including picture books, poetry, myth, fable, folk tale, fantasy, and realistic fiction. Central to the course is development of critical principles for assessing the literary merit of children's books. Other possible emphases: the creative process; archetypes and values in the works studied; images of childhood; children's responses to literature; and issues in children's book selection. [English 3103 and/or 3104 required for English majors seeking intermediate teacher license.] (*Fall, Spring*)

ENGL 3104. Literature for Adolescents. (L) (3) Introduction to literature for adolescents. Emphases are: (1) critical analysis and aesthetic judgment of literature; (2) study of representative examples from all major genres (poetry, fiction and drama) as well as various subgenres (such as biography, science fiction, fantasy, and contemporary realistic juvenile fiction) which address the cognitive, emotional and psychological needs of junior high and high school students. Students will practice applying these approaches to adolescent literature and will employ these concepts in critically selecting, evaluating and judging books for adolescents. [English 3103 and/or 3104 required for English majors seeking intermediate teacher license.](*Yearly*)

ENGL 3110. Literature and Science. (WV) (3) The works of scientists (such as Darwin, Freud, or Einstein) and their influence on literature studied along with the role of creativity, imagination, and communication in literature and science. (*Alternate years*)

ENGL 3112. Medieval British Literature. (3) Representative works (excluding those of Chaucer) written in Britain during the Middle Ages, especially the epic and romance, mainly studied as reflections of the medieval individual's relationship to God, society and other individuals. An introduction to the earliest British literature as it evolved from pagan folklore under the influence of myth, fantasy, courtly convention, the new religion, foreign invasion, and transformations in language and culture. Most of the works studied in this course will be translated into modern English. (*On demand*)

ENGL 3114. British Prose and Poetry of the 16th Century. (3) Major works of the Renaissance "Golden Age," including Sidney, Marlowe, Shakespeare (excluding drama). Included are satire, the pastoral romance in prose, and the many new poetic forms that continue to the present day, such as the sonnet and blank verse. (*On demand*)

ENGL 3115. The Earlier 17th Century. (3) Major writers from Bacon and Donne to the Restoration. (*On demand*)

ENGL 3123. Wit and Sensibility: 18th-Century British Literature. (3) Poetry and prose in the golden age of satire, with emphasis on Dryden, Pope, Swift and Johnson. Early Romantic trends in the poetry of Young, Grey, and Collins. (*Alternate years*)

ENGL 3125. The Romantic Era, 1785-1832. (3) The development of the Romantic movement, with emphasis on the works of Wordsworth, Coleridge and other major poets. (*Yearly*)

ENGL 3126. The Victorian Era to 1870. (3) Readings in British literature of the middle of the 19th century, reflecting such cultural developments as the rise of industrialism and technology, England's global empire, the rapidly changing nature of society, the religious crisis, and the beginnings of artistic and literary revolt against the establishment. (*Yearly*)

ENGL 3127. British Literature from 1870 to World War I. (3) Readings emphasizing such cultural and literary developments as realism and the impact of science, art for art's sake, problems of religious faith and of sexuality, moral and political issues relating to colonialism, British imperialism, and new techniques in art and literature. (*Yearly*)

ENGL 3128. British Literature Since World War I. (3) Readings reflecting developments such as the decline of Britain as a world power, the intellectual disillusionment following World War I, the impact of psychological and social theory, and literary innovation and experimentation. (*Alternate years*)

ENG 3132. Introduction to Contemporary American English. (3) Introduction to the study of word formation, the sound system, and the structure of contemporary American English, including characteristics and applications of traditional grammar. *(On demand)*

ENGL 3140. Colonial and Early American Literature. (3) Origins of American literature, from Colonial times to Washington Irving, including such authors as Edwards, Taylor, Franklin, Crevecoeur, Freneau, Brown. (*Alternate years*)

ENGL 3141. American Literature of the Romantic Period, 1820-1870. (3) Important writers and ideas of the period of American romanticism, from Irving through Whitman, including such authors as Poe, Emerson, Thoreau, Hawthorne, Melville. (*Yearly*)

ENGL 3142. American Literature of the Realistic and Naturalistic Periods, 1870-1920. (3) Important writers and ideas of American literature from Whitman through the period of World War I, including such authors as Dickinson, Twain, Howells, James, Crane, Dreiser, Frost. (*Yearly*)

ENGL 3143. Modern American Literature, 1920 to Present. (3) Important writers and ideas of modern American literature, including such authors as Faulkner, Eliot, Hemingway, Cummings. (*Yearly*)

ENGL 3156. American Indian Literature. (X) (3) Survey of American Indian literature, ranging from the oral tradition to the poems and novels of contemporary writers

including such writers as N. Scott Momaday, James Welch, and Leslie M. Silko. (*On demand*)

ENGL 3200. Writing in the Discipline of English. (W) (3) Prerequisite: English major or minor or permission of the Department. Intensive practice in writing persuasion and argument in the discipline of English, with emphasis on techniques in research and documentation based on selected texts in literature, rhetoric/writing, or linguistics/language. Restricted to English majors and minors, except through permission of the Department. *(Fall, Spring, Summer)*

ENGL 3852. Independent Study. (1-3) Prerequisite: consent of the department. Individual investigations and appropriates exposition of the results. (Unless special permission is granted by the department chair, no more than six hours of 3852 may apply toward the English major.) *(Fall, Spring, Summer)*

Undergraduate/Available for Graduate Credit

Additional work required for students receiving graduate credit. Departmental permission also required for graduate students to repeat any of the following courses taken previously for undergraduate credit.

ENGL 4002. Women and Literature. (3) (3G) Selected topics focusing on women and literature, such as images of women, women as writers, and women as literary critics. With permission of the English Department, may be repeated for credit as topics vary. (However, only six hours may be used for the requirements for the English major.) (*Yearly*)

ENGL 4008. Topics in Advanced Technical Communication. (3) (3G) Prerequisites: ENGL 2116 and COMM 1101. Exploration, both theoretically and practically, of the interrelation of written, oral and graphic communication within technical rhetorical contexts. May be repeated once for additional credit with the approval of the English Department. (*On demand*)

ENGL 4050. Topics in English. (3) (3G) Special topics not included in other courses. May be repeated for additional credit with approval of the English Department. *(On demand)*

ENGL 4090. Major Authors. (3)(3G) The works, ideas and life of one to three significant authors. With permission of the English Department, may be repeated once for credit as long as different authors are considered. (*Fall, Spring*)

ENGL 4114. Milton. (3) (3G) A study of the major poems and selections from the minor works of Milton. (*Alternate years*)

ENGL 4116. Shakespeare's Early Plays. (3) (3G) A study of 10 representative plays from the comedies, histories and tragedies written 1590-1600. (*Fall, Spring*)

ENGL 4117. Shakespeare's Late Plays. (3) (3G) A study of 10 representative plays from the period 1600-1611, including the late tragedies and tragi-comedies. (*Fall, Spring*)

ENGL 4121. The 18th-Century British Novel: Man, Woman, Manners and Morals. (3) (3G) The novel as narrative form and as mirror of the individual in society. Emphasis on fiction by Defoe, Richardson, Fielding, Sterne, Austen, with further readings in the novel of manners and the Gothic romance. (*Alternate years*)

ENGL 4122. The Victorian Novel. (3) (3G) Readings in British fiction during the triumph of the novel in the19th century, emphasizing major developments in realism, romance, naturalism. (*Alternate years*)

ENGL 4123. The Modern British Novel. (3) (3G) Representative British novels that embody the cultural and literary developments of the 20th century: the impact of two world wars, the influence of important psychological and economic factors of modern life and their relationships to new techniques in art and literature. (*Alternate years*)

ENGL 4124. Modern Irish Literature. (3) (3G) Readings in Irish literature since 1885, with consideration of the mythology, folklore, and social history of Ireland as they are expressed in poetry, drama and fiction. (*Yearly*)

ENGL 4131. British Drama to 1600, Excluding Shakespeare. (3) (3G) A survey of the development of British drama to 1600, with representative plays from the Mystery-Miracle Cycles, the Morality Plays, and Tudor drama, including Lyly, Kyd, Marlowe, Peele, Greene, Dekker. (*On demand*)

ENGL 4132. British Drama from 1600-1642, Excluding Shakespeare. (3) (3G) A survey of Jacobean and Caroline drama, including plays by Jonson, Beaumont and Fletcher, Webster, Middleton, Shirley, Ford. (*Alternate years*)

ENGL 4133. British Drama of Wit and Intrigue, 1660-1780. (3) (3G) The famous bawdy comedy of manners and the heroic drama of the Restoration, followed by the sentimental comedy and satiric burlesque of the 18th century. (*Alternate years*)

ENGL 4143. The American Novel of the 19th Century. (3) (3G) Major novelists and traditions from the beginnings of the American novel through the rise of realism, including such novelists as Hawthorne, Melville, Twain, Howells, James. (*Alternate years*)

ENGL 4144. The American Novel of the 20th Century. (3) (3G) Major novelists and traditions from the emergence of naturalism to the present, including such novelists as Crane, Dreiser, Hemingway, Faulkner. (*Yearly*)

ENGL 4145. Literature of the American South. (3) (3G) Selected works of Southern writers which reflect literary and cultural concerns from Colonial times to the present, including such authors as Poe, the early humorists, local color writers, Chopin, Faulkner, Warren, O'Connor, Welty. (*Yearly*)

ENGL 4146. Contemporary Jewish-American Literature. (X) (3) (3G) An introduction to the scope and shape of the contemporary Jewish-American literary tradition. Such writers as Bellow, Malamud, Roth, Singer, and Potok will be studied. (*Alternate years*)

ENGL 4147. Early Black American Literature. (3) (3G) A survey of significant writings by black Americans before the Harlem Renaissance. (*Alternate years*)

ENGL 4148. Twentieth-Century Black American Literature: Prose. (3)(3G) Intensive study of selected black American 20th-century writers of fiction and nonfiction, beginning with the Harlem Renaissance. (*Alternate years*)

ENGL 4149. Twentieth-Century Black American Literature: Poetry and Drama. (3)(3G) Intensive study of selected black American 20th-century writers of poetry and drama, beginning with the Harlem Renaissance and including the Black Arts Movement. (*Alternate years*)

ENGL 4150. Contemporary Poetry. (3) (3G) Poetry in English (including translations) since 1940. (*On demand*)

ENGL 4151. Modern Drama. (3) (3G) Representative Continental, British, and American plays, from Shaw to the present. (*Alternate years*)

ENGL 4152. Modern European Literature. (3) (3G) Selected modern European authors, translated into English, whose works have been of special interest to readers and writers of British and American literature. (*Alternate years*)

ENGL 4153. Contemporary Fiction. (3) (3G) Selected present-day fiction, with an emphasis upon works from outside the United States and Britain. Works not originally in English will be studied in translation. (*Alternate years*)

ENGL 4155. Pan-African Literature. (3) (3G) Introduction to significant Pan-African literature, emphasizing the oral tradition, selected works of major authors in the Caribbean and Africa, and the relationships of these traditions to American, British and other literary traditions. Works not originally written in English will be studied in translation. (*On demand*)

ENGL 4161. Modern English Grammar. (3) (3G) A study of the structure of contemporary English, with an emphasis on descriptive approaches. (*Yearly*)

ENGL 4165. Language and Culture. (3) (3G) Readings in and discussion and application of the interrelationships between language and culture, including basic introduction to contemporary American dialects and to social contexts of language. (*Yearly*)

ENGL 4166. Comparative Language Studies for Teachers. (3) (3G) Prerequisite: ENGL 3132, or ENGL 6161, or permission of the Department. An introductory course designed to aid the teacher of English as a Second Language in comparing the systems of sound and structure of another language with those systems in English. (*Yearly*)

ENGL 4180. Theories of Technical Communication. (3) (3G) Prerequisite: ENGL 2116. Rhetorical, psychological, and anthropological theories which underscore the interrelations of written and graphic communication within technical, rhetorical contexts. *(Fall)*

ENGL 4181. Writing User Documents. (3) (3G) Prerequisite: ENGL 2116. Researching and analyzing audiences to write publishable instructions. This includes the production, testing, and revision of tutorials, reference manuals and on-line documents for users of computers and other devices. *(Spring)*

ENGL 4182. Writing and Designing Computer-based Documents. (3) (3G) Prerequisite: ENGL 2116. Theoretical and practical exploration of desktop publishing. Students will write and publish camera-ready documents by rhetorically integrating text and graphics using computer aids. *(Fall)*

ENGL 4183. Editing Technical Documents. (3) (3G) Prerequisite: ENGL 2116. Document editing, including copy editing, proofreading, substantive editing, and project management. *(Spring)*

ENGL 4202. Writing Poetry. (3) (3G) Prerequisite: ENGL 2126, or graduate student status, or permission of instructor. Further study of and practice in the writing of poetry within a workshop format. May be repeated once for credit with the consent of the English Department. (*Fall, Spring) (Evenings*)

ENGL 4203. Writing Fiction. (3) (3G) Prerequisite: ENGL 2126, or graduate student status, or permission of instructor. This course provides further study of and practice in the writing of fiction within a workshop format. May be repeated once for credit with the consent of the English Department. *(Fall, Spring) (Evenings*)

ENGL 4204. Expository Writing. (W) (3) (3G) Writing of essays, criticism and various forms of exposition. (*Fall, Spring) (Evenings*)

ENGL 4205. Advanced Expository Writing. (3) (3G) Prerequisite: ENGL 4204. May be repeated once for credit with permission of the English Department. (*Alternate years*)

ENGL 4208. Poetry Writing Workshop. (3) (3G) Prerequisite: ENGL 4202. Designed for advanced writers of poetry. Focuses primarily on student work and peer criticism of it. May be repeated once for credit with permission of department. (*Yearly*)

ENGL 4209. Fiction Writing Workshop. (3) (3G) Prerequisite: ENGL 4203. Designed for advanced writers of fiction. Focuses primarily on student work and peer criticism of it. May be repeated once for credit with permission of department. *(Yearly)*

ENGL 4210. Greek and Roman Drama In Translation. (3) (3G) A study of selected plays of Aeschylus, Sophocles, Euripides, Aristophanes, Plautus, Terence, and Seneca with emphasis on dramaturgy and the development of the Greek and Roman theater. (*On demand*)

ENGL 4211. Chaucer. (3) (3G) The poetry of Geoffrey Chaucer, including The Canterbury Tales and Troilus and Criseyde. (*Alternate years*)

ENGL 4251. Literary Criticism Through Arnold. (3) (3G) The major schools and critics of literary criticism. *(On demand)*

ENGL 4252. Modern Literary Criticism. (3) (3G) Theories of the modern schools of criticism. *(On demand)*

ENGL 4254. Teaching English/Communications Skills to Middle and Secondary School Learners. (1-3) (1-3G) Approaches to the teaching of English, including recent theories and research related to writing and literary study, designed primarily for teaching in grades 6-12. *(Yearly)*

ENGL 4260. History of the English Language. (3) (3G) Origins and development of the English language, both spoken and written, from its earliest forms to contemporary usage. *(Yearly)*

ENGL 4263. Linguistics and Language Learning. (3) (3G) Readings in, discussions of, and application of linguistically oriented theories of language acquisition, directed toward gaining an understanding of language-learning processes and stages. *(Alternate years)*

ENGL 4264. Literacy in Family and Community. (3) (3G) Exploration of literacy issues and outreach in schools, agencies, and work sites. *(Spring)*

ENGL 4290. Advanced Creative Project. (3) (3G) Prerequisite: ENGL 4208 or 4209 or permission of the instructor. The planning, writing, and polishing of a work of at least 20 pages of poetry or at least 40 pages of fiction or creative non-fiction by advanced undergraduate or graduate students with the guidance of a member of the Department's creative writing faculty. The final work may be a single piece or a collection of pieces and will evolve under the supervision of the primary instructor. With permission of the Department, students who took the course as undergraduates may repeat as graduate students. *(On demand)*

ENGL 4400. English Composition Practicum. (W) (1-3) (1-3G) Prerequisite: consent of the instructor. Through supervised tutorial experience and seminars, this course introduces the student to current developments concerning composition and to a variety of methods for teaching English composition. This course is highly recommended for those planning to teach or those currently engaged in teaching. With permission of the English Department may be repeated once for credit. *(Fall, Spring)*

ENGL 4410. Professional Internship. (3 or 6) (3G or 6G) Prerequisites: permission of English Internship Coordinator. Restricted to juniors, seniors, graduate students majoring in English or minoring in English or Communications who have at least a 2.5 GPA and a course in professional communication (e.g., journalism, technical communication, public relations, public relations lab, or mass media). Students work 8-10 hours (3 hours credit) or 16-20 hours (6 hours credit) per week in a placement arranged by the Internship Coordinator. Only three credit hours may be applied to the English major at either the undergraduate or graduate level; three additional hours may be counted as a University or Communications elective. *(Fall, Spring, Summer)*

ENGL 4852. Independent Study. (1-3) (1G-3G) Prerequisite: Consent of the Department. Individual investigations and appropriate exposition of the results. (Unless special permission is granted by the Department Chair, no more than six hours may apply toward the English major.) May be repeated for additional credit with approval of the English Department. *(Fall, Spring, Summer)*

Graduate Only

ENGL 6062. Topics in Rhetoric. (3G) Examination of and/or research concerning selected issues in rhetorical theory or pedagogy. May be repeated for credit with English Department approval. *(Fall, Spring)*

ENGL 6070. Topics in English. (3G) Selected topics of literature and language. May be repeated for credit as topics vary and with English Department approval. *(Fall, Spring)*

ENGL 6101. Introduction to English Studies. (3G) The discipline of English--its nature, its history, and its methods. Emphasis on (1) the interrelations of literature, language, and writing; and (2) the diversity of cultural origins and critical perspectives in English studies, with concentration on selected major critical approaches. Intensive writing and practice in methods of research. Required of all M.A. in English students, preferably at or near the beginning of their programs. *(Fall, Spring, Summer)*

ENGL 6102. Literary Theory. (3G) Modern literary theory focusing on the theoretical concepts which underpin literary analysis. Emphases may differ from semester to semester; readings will focus on major theoretical statements and on criticism which applies several approaches to particular literary works. Students will be required to apply what they have learned. *(Yearly)*

ENGL 6103. The Worlds of Juvenile Literature. (3G) Poetry, folk literature, modern fantasy, realism, and illustrations in books for young children and adolescents. Analysis of the literary qualities which distinguish the classic from the ephemeral through such critical approaches as the historical, the sociological, the psychological and the archetypal. *(Yearly)*

ENGL 6111. Shakespeare's Comedies and Histories. (3G) Source materials, textual problems and stage conventions in selected comedies and history plays illustrating Shakespeare's dramaturgy. *(Yearly)*

ENGL 6112. Shakespeare's Tragedies. (3G) Source materials, textual problems and stage conventions of the great tragedies, illustrating Shakespeare's dramaturgy. *(Yearly)*

ENGL 6113. Milton. (3G) The complete poetry and selections from the prose. *(On demand)*

ENGL 6123. The Augustan Age, 1660-1785. (3G) Close reading of Dryden, Pope, Swift, Johnson, and a consideration of other literary figures and trends, in the light of intellectual and historical currents. *(On demand)*

ENGL 6125. The Romantic Era, 1785-1832. (3G) Development of the Romantic movement, with emphasis on the works of Wordsworth, Coleridge and other major poets. *(Alternate years)*

ENGL 6126. The Victorian Era, 1832-1900. (3G) Emphasis on Tennyson, Robert Browning, Arnold, Carlyle, Ruskin, Newman. (*Alternate years*)

ENGL 6141. American Romanticism. (3G) Major writers of the 1830s, 40s, and 50s, including Hawthorne, Melville, Whitman, Emerson, Thoreau, and the Transcendental Movement. (*Alternate years)*

ENGL 6142. American Realism and Naturalism. (3G) Major writers of the two movements before and after the end of the 19th century, including Twain, Howells, James, Crane, Dreiser, Norris. (*Alternate years*)

ENGL 6143. American Modernism. (3G) Six to eight writers of the period since World War I, both prose and poetry. (*Alternate years*)

ENGL 6144. Stylistics. (3G) Methodologies for analysis of the style of texts, with special emphasis on diction, syntax, prose, rhythm, voice, and, metaphor. *(Alternate years)*

ENGL 6147. Perspectives in African-American Literature. (3G) A survey of African-American literature, emphasizing the major authors, those relevant historical and social factors, and those specific literary movements that have influenced the development of African-American literature. (*Alternate years*)

ENGL 6160. Introduction to the English Language. (3G) History and nature of English, its grammar, syntax, and lexicon. Integrates the study of language-based rhetorical and literary theory, asks students to consider the nature of language in general, its impact on the user, and the development of the systems of English, concentrating on features of major British and American dialects and registers. (*Fall, Spring*)

ENGL 6161. Introduction to Linguistics. (3G) Introduction to linguistics, its techniques and objectives, descriptive and historical approaches, language families, language and culture. (*Alternate years)*

ENGL 6162. History of the English Language. (3G) Origins and development of spoken and written English, from its earliest forms to contemporary usage, with some attention to dialects and lexicography. (May not also receive credit for ENGL 4260.) *(Alternate years)*

ENGL 6163. Language Acquisition. (3G) Prerequisite: ENGL 6160 or permission of the instructor. Linguistic theories of first and second language acquisition, including processes and stages of language development. (May not also receive credit for ENGL 4263.) *(Alternate years)*

ENGL 6166. Rhetorical Theory. (3G) Rhetorical theories, past and present, focusing on ways that these varied frameworks of understanding have informed the generation, understanding, and pedagogy of writing and other modes of discourse. Emphases will vary from semester to semester, readings will concentrate on major selected rhetorical theories and on implications of these theories for the understanding and pedagogy of discourse. (*Yearly*)

ENGL 6195. Teaching College English (3G) Examination of major issues in the theory and practice of literature and composition instruction at the college level. (*Yearly*)

ENGL 6495. Internship in College Teaching. (3G) Prerequisite: ENGL 6195. Teaching in one section offered by the English Department under supervision of English faculty. Students will be accepted for internship only near the end of the degree program and upon approval of the department. Students will be assigned to teach selected basic courses, and also will participate in periodic conferences and seminars. It is strongly recommended that students also take ENGL 4400 before ENGL 6195. *(Fall, Spring)*

ENGL 6680. Seminar in British Literature. (3G) (*Yearly*) *(Evenings)*

ENGL 6685. Seminar in American Literature. (3G) (*Yearly*) *(Evenings)*

ENGL 6890. Directed Reading. (1-3G) (*Fall, Spring, Summer*)

ENGL 6996. Thesis. (6G) Appropriate research and written exposition of that research, which may or may not be an outgrowth of work done in previous courses. If the thesis is the outgrowth of previous coursework, considerable additional research and exposition must be done beyond that previously undertaken. The proposed thesis work, as well as the final product, will be approved by a committee of three faculty appropriate to the topic, appointed by the Chair of the department after consultation with the student, on the basis of a written proposal from the student. It is recommended that thesis work not be undertaken until near the end of progress toward the degree. The thesis title is to be shown on the student's final transcript. A Creative Thesis option is available for students who have completed appropriate coursework in Creative Writing. (A statement of recommendations and requirements for form and procedure is available in the English Department office.) (*Fall, Spring, Summer*)

ENGINEERING (ENGR)

Undergraduate

ENGR 1201. Introduction to Engineering Practice and Principles I. (2) An overview of the profession and introduction to different disciplines, including Computer Science, and Civil, Electrical, and Mechanical Engineering, and to computing and teamwork in practical applications. *(Fall, Spring) (Evenings)*

ENGR 1202. Introduction to Engineering Practice and Principles II. (2) Preprequisite: ENGR 1201. A continuation of ENGR 1201 with separate applications in the disciplines of Civil, Electrical, and Mechanical Engineering involving individual and team assignments, including interdisciplinary classroom sessions on critical thinking, creative problem solving, project planning, effective technical presentations, and teamwork; and disciplinary team projects. *(Fall, Spring, Summer) (Evenings)*

ENGR 3590. Engineering Cooperative Education Experience. (0) This course is required of Co-op students during the semester they are working. (*Fall, Spring, Summer)*

ENGR 3670. Total Quality Systems. (3) Prerequisite: Junior or Senior status and permission of instructor. An interdisciplinary approach to principles and practice in the applications of continuous quality improvement (CQI) and Total Quality Management (TQM). Classroom work on major applications, re-engineering processes; process mapping, personal effectivenss and time management; technical presentations; CQI tools, statistical process control, designed experimentation; management and planning tools, engineering economy, and case studies; assignments and projects in team building, communication, and group problem solving. *(Spring)*

EARTH SCIENCES (ESCI)

Undergraduate

ESCI 1101. Earth Science-Geography. (3) Basic geographical principles and processes in physical geography and the earth sciences: geographic locational methods, earth-sun relationships, earth radiation balance, atmospheric tempreature and pressure, interpretation and simple forecasting of weather from mapped data, interpretation of soil-moisture and evapotranspiration balances, soil, climate systems and biomes. *(Fall, Spring) (Evenings)*

ESCI 1101L. Earth Science-Geography Laboratory. (1) Prerequisite or co-requisite: ESCI 1101. Experimental study and investigation of the basic principles and processes in physical geography and the earth sciences; geographic locational methods, earth-sun relationships, earth radiation balance, atmospheric temperature and pressure, interpretation and simple forecasting of weather from mapped data, interpretation of soil-moisture and evapotranspiration balances, climate systems and biomes. One laboratory period of two hours per week. * *(Fall, Spring) (Evenings)*

* Although the laboratory and lecture sections of ESCI 1101 are taught as separate courses, it is strongly recommended that students take ESCI 1101L concurrently with ESCI 1101. Students with scheduling problems or students not fulfilling the university science and technology requirements may take the lecture without the laboratory. Students fulfilling the university science and technology requirements must either: (a) Take ESCI 1101 and ESCI 1101L concurrently; or (b) Take ESCI 1101L in a semester subsequent to taking ESCI 1101.

ESCI 2101. The Environmental Dilemma. (V) (3) Nature, causes and responses to major environmental problems. *(Yearly)*

ESCI 2105. Oceanography. (3) Oceanography with emphasis on physical, chemical and geological aspects of the world oceans. Oceanic circulation, seawater composition and chemistry, and marine sedimentation and geology. *(On demand)*

ESCI 2200. Introduction to Earth Sciences Research. (3) Prerequisites or corequisites: ESCI 1101; GEOL 1200 and 1200L. Basic techniques common to research in all of the earth sciences. Research design and organization, utilization of literature resources and the use of quantitative methods. *(Fall, Spring) (Evenings)*

ESCI 2210. Field Methods in the Earth Sciences. (4) Prerequisites: ESCI 1100; GEOL 1200, 1200L; and ENGL 2116 or consent of instructor. Field techniques used in studies of geology, topography and earth sciences. Skills related to the colleetion and presentation of scientific data emphasized. Three lecture hours, two hours of lab per week. Earth Science majors should take ESCI 2210 as soon as possible after completion of ESCI 1101 and 1200-1200L. *(Spring, Fall)*

ESCI 3000. Selected Topics in Earth Sciences. (1-4) Prerequisite: ESCI 1101 or GEOL 1200-1200L and consent of instructor. In-depth treatment of specific topics selected from one of the fields of the earth sciences. May be repeated for credit as topics vary. *(Yearly)*

ESCI 3150. Natural Environments of North America. (3) Prerequisites: ESCI 1101 or GEOL 1200-1200L. Regional geomorphology and ecology of North America with emphasis on development, maintenance, and interaction of the geomorphic and ecological provinces. *(On demand)*

ESCI 3170. Environmental Quality Management. (3) Selected methods of air and water resource analysis with emphasis on conceptual models and statistical techniques of environmental and risk management. *(Fall)*

ESCI 3180. Environmental Impact Analysis. (3) Prerequisite: junior-senior standing. Environmental impact requirements and associated procedures, guidelines and methods of assessing physical environmental impacts. Three hours per week of combined lecture and supervised field work leading to the preparation of an environmental impact statement for a locally proposed action. *(On demand)*

ESCI 3210. Soil Science. (3) Prerequisites: GEOL 1200, 1200L. Corequisite: CHEM 1251 or consent of the instructor. Study of soils-forming processes, with emphasis on management and use of soils. Two hours of lecture, three hours of lab per week with occasional field trips. *(Fall)*

ESCI 3240. Boundary-Layer Meteorology. (4) Prerequisites: ESCI 1101, MATH 1241, or consent of instructor. Examines the flows of energy, water and gases within the planetary boundary layer and the exchange of energy and mass at the earth's surface. Theories of interactions within the boundary-layer. Three hours of lecture, three hours of lab. *(Spring)*

ESCI 3250. Dynamic Meteorology. (4) Prerequisite: ESCI 1101 and MATH 1241 or consent of instructor. In-depth examination of atmospheric dynamics, including the nature of thermodynamics and water vapor, horizontal motion in the atmosphere, characteristics of fluid flow applied to the atmosphere and the general circulation models. Three hours of lecture and one three-hour lab per week. *(Fall)*

ESCI 3251. Synoptic Meteorology. (4) Prerequisite: ESCI 3250. An extension of ESCI 3250 to include atmospheric modeling, analysis of air mass structure, synoptic analysis with quantitative forecasting techniques, severe storm characteristics, wind shear, boundary-layer meteorology, and techniques for differentiating climatic regime traits and

analysis of their variation through time. Three hours of lecture and one three-hour lab per week. (*On demand*)

ESCI 3252. Weather Analysis Laboratory. (1) Prerequisite or corequisite: ESCI 3250 and consent of instructor. Weather observation, meteorologic data collection and analysis, and techniques of weather forecasting. May be repeated for credit. (*On demand*)

ESCI 3500. Earth Science Cooperative Education Experience. (0) Enrollment in this course is required for the Department's earth science cooperative education students during each semester that they are working. Evaluation is *Pass/No Credit*. (*Fall, Spring, Summer*)

ESCI 3501. Earth Science Cooperative Education Seminar. (1) This course is required of earth science cooperative education students in each semester following a work assignment for presentation of earth science reports on the co-op learning experience. (*Fall, Spring, Summer*)

Undergraduate/Available for Graduate Credit

ESCI 4000. Selected Topics in Earth Sciences. (1-4) (1-4G) Prerequisites: ESCI 1101, GEOL 1200-1200L, or permission of the instructor. In-depth treatment of specific topics selected from one of the fields of the earth sciences. May be repeated for credit as topics vary. *(On demand)*

ESCI 4140. Hydrologic Processes. (4) (4G) Prerequisite: ESCI 1101 or GEOL 1200-1200L. Atmospheric, soils and geologic aspects of surface and ground water processes. Three lecture hours and one two-hour lab per week. (*Fall*)

ESCI 4150. Applied Climatology. (3) (3G) Prerequisite: ESCI 3250 or consent of instructor. Methods of acquiring and analyzing climatic data in various types of applied problems. Emphasis on methods to assess and reduce the impact of weather and climate upon human activities. (*Spring*)

ESCI 4155. Fluvial Processes. (4) (4G) Prerequisite: ESCI 4140. Hydrologic and geomorphic study of the transport of water and earth materials within stream systems. Erosion, mass wasting, open channel flow, sediment transport, flooding, stream channel morphology, morphometry of drainage basins, and related topics. Three lecture hours, two lab hours per week. (*Spring*)

ESCI 4160. Fundamentals of Remote Sensing. (4) (4G) Prerequisite: ESCI 1101 or GEOL 1200, or consent of instructor. Physical fundamentals of remote sensing and overview of airborne and satellite systems operating in the visible, infrared, and radar regions, and a review of applications for resource exploration, environmental studies, land use and land cover analysis, and natural hazards. One 2-1/2 hour lecture, and one three-hour lab per week. (*On demand*) *(Evenings)*

ESCI 4400. Internship in Earth Sciences. (3-6) (3-6G) Prerequisite: consent of the Department. Research and/or work experience designed to be a logical extension of a student's academic program. The student must apply to Department for an internship by submitting a proposal which specifies the type of work/research experience preferred and how the internship will complement his or her academic program. The Department will attempt to place the selected students in cooperating community organizations to complete specified research or work-related tasks which are based on a contractual arrangement between the student and community organization. The student can receive three to six hours credit, depending on the nature and extent of the internship assignment. (*On demand*)

ESCI 4800. Individual Study in Earth Sciences. (1-4) (1-4G) Prerequisite: permission of the Department and credit hours established in advance. Tutorial study or special research problems. May be repeated for credit as topics vary. (*On demand*)

Graduate and Advanced Undergraduate

ESCI 5160. Digital Image Processing in Remote Sensing. (4) (4G) Prerequisite: ESCI 4160 or consent of instructor. Scientific and computational foundations of digital image processing techniques for extracting earth resource information from remotely sensed data. Three lecture hours and three lab hours per week. (*Spring*)

ESCI 5222. Watershed Science. (3) (3G) Prerequisites: Earth Science Majors and M.A. Geography students: ESCI 4140 or 4155 or GEOL 4145; Biology Majors and M.S. Biology students: BIOL 4149 and consent of the instructor; Civil Engineering Majors and M.S.C.E. students: CEGR 3141 or 5144 and consent of the instructor; all others require the consent of the instructor. Examination of the cycling of water and chemical elements in natural and perturbed watersheds with emphasis on linkages between the hydrologic and biogeochemical processes which control runoff water quality. Topics include runoff processes, evapotranspiration, nutrient export and stream, riparian and hyporheic zone hydrochemical dynamics. *(Spring)*

Graduate Only

ESCI 6060. Earth Sciences Field Investigations. (1-6G) Prerequisite: consent of instructor. A concentrated field investigation of selected earth sciences topics. Course subject matter, credit hours, location and duration will be specified each time course is offered. May be repeated for credit. *Pass/No Credit* grading. *(On demand)*

ESCI 6650. Workshop in Geography. (4G) A series of lectures on the subject matter of the atmosphere and hydrosphere with accompanying laboratory sessions. *(On demand)*

ESCI 6651. Workshops in Geology. (4G) A series of lectures on the subject matter of lithosphere and space science with accompanying laboratory sessions. *(On demand)*

ENGINEERING SCIENCE (ESGR)

Undergraduate

ESGR 2141. Engineering Mechanics I. (3) Prerequisite: PHYS 2101. Corequisite: MATH 1242. Principles of particle and rigid body mechanics with engineering applications; force systems and resultants; the equilibrium of particles and rigid bodies; friction; properties of areas and volumes. (*Fall, Spring, Summer*) *(Evenings)*

ESGR 2142. Engineering Mechanics II. (3) Prerequisites: Civil Engineering Major and ESGR 2141. Corequisite: MATH 1242. The kinematics and kinetics of particles. Work-energy and impulse-momentum principles and conservation laws. Introduction to the dynamics of systems of particles and of rigid bodies. Energy and momentum methods. *(Spring, Summer) (Evenings)*

ESGR 2143. Statics and Strength of Materials. (3) Prerequisites: Electrical Engineering Major and PHYS 2101. Corequisite: MATH 1242. Force systems, resultant and equilibrium of particles and rigid bodies. Introduction to the engineering theory of deformable solids with applications. *(Spring)*

ESGR 2144. Introduction to Solid Mechanics. (3) Prerequisites: ESGR 2141 and MATH 2241. Engineering theory of deformable solids and applications. Stress and deformation resulting from axial, torsion and bending loads. Topics include shear and moment diagrams, Mohr's circle for stress and strain and buckling of columns. *(Fall, Spring, Summer) (Evenings)*

ESGR 3090. Special Topics in Engineering Science, Mechanics and Materials. (1-4) Prerequisite: consent of the department. Technical Elective. Builds upon and synthesizes knowledge gained from the engineering science, mathematics and physical science stem of the core curriculum. Specific topics teach engineering analysis, synthesis and design and provide an opportunity for students to investigate an area of specialization. May be repeated for credit. *(On demand)*

ESGR 3131. Introduction to Electronic Materials. (3) Prerequisite: PHYS 2231, with a grade of *C* or better. Technical Elective. Electronic materials and devices with examples from crystalline and amorphous semiconductors, junction and MOS devices, thermoelectrics, lasers and super-conductors. Introduction to the quantum mechanics of electrons in solids, electron-atom interactions and energy band model, providing a basis for rationalizing a wide variety of electronic properties. *(Fall)*

ESGR 3890. Individualized Study. (1-3) Prerequisite: consent of the department. Technical Elective. Supervised individual study with an area of particular interest to a student which is beyond the scope of the courses. May be repeated for credit. *(On demand)*

ESGR 3990. Undergraduate Research. (1-4) Prerequisite: consent of the department. Technical Elective. Independent study of a theoretical and/or experimental problem in a specialized area of engineering science, mechanics and materials. Students pursue an area or problem in more depth than possible in other courses. Topics for investigation may originate from the student or the faculty member supervising the study. May be repeated for credit. *(On demand)*

Undergraduate/Available for Graduate Credit

Additional work required for graduate credit.

ESGR 4131. Solid State Transformations. (3) (3G) Prerequisite: MEGR 3161, with a grade of *C* or better. Technical Elective. Thermodynamics, morphology and kinetics of solid state transformations. Diffusion and absolute reaction rate theory; crystallographic nature of phase transformations; nucleation and growth processes; precipitation and oxidation reactions. (*Alternate years*)

ESGR 4134. Solid State Electronics. (3) (3G) Prerequisite: EEGR 3121 or ESGR 3131 or PHYS 2241, each with a grade of *C* or better, or consent of instructor. Technical Elective. Electron theories of solids. Quantum mechanical foundations. Free electron and band models. Electron transport processes in metallic and nonmetallic conduction; diffusion and drift phenomena. Theory of semiconductors. *(Spring)*

ESGR 4162. Materials Production and Process. (3) (3G) Prerequisites: MEGR 3161, with a grade of *C* or better, and consent of instructor. Technical Elective. Applications of thermodynamics and chemistry to extractive process metallurgy. Fundamental principles of materials forming operations. Casting, mechanical working and joining methods. (*Alternate years)*

ESGR 4165. Introduction to Nondestructive Evaluation Methods. (3) (3G) Prerequisite: MEGR 3161, with a grade of *C* or better. Technical Elective. Nondestructive evaluation principles and techniques, including liquid penetrants, magnetic particle, acoustic emission, ultrasound, radiography and eddy currents. (*Alternate years*)

Graduate and Advanced Undergraduate

The 5000-level courses are first-year graduate courses although some advanced seniors may enroll with permission of the department.

ESGR 5090. Special Topics. (1-6) (1-6G) Directed study of current topics of special interest. May be repeated for credit. *(On demand)*

ESGR 5102. Introduction to Continua. (3) (3G) Prerequisites: MEGR 3111, EEGR 3121, ESGR 3141 and MEGR 3114 or consent of instructor. A unified treatment of those topics which are common to all continua. Stress, deformation and velocity fields, constitutive equations and field equations. Representative applications in solid, fluid and electromagnetic continua, including interaction problems. *(On demand)*

ESGR 5114. Energy Conversion II. (3) (3G) Prerequisites: MEGR 3112 and 4111. Study of conversion of heat into power. Thermoelectric, magnetohydrodynamic engines, thermionic converters, solar and fuel cells. (*Alternate years*)

ESGR 5132. Quantum and Parametric Electronics. (3) (3G) Prerequisite: EEGR 3122 or PHYS 3131 or consent of instructor. Quantum mechanics; spin energy levels; elementary masers, optical resonance; traveling wave tubes; backward wave oscillators. (*Alternate years*)

ESGR 5161. Atomic Processes in Solids. (3) (3G) Prerequisite: ESGR 4131 or consent of department. Processes dependent on large- and small-scale atomic motions leading to changes in material structures and properties. Theories of diffusion controlled and diffusionless transformations. Modern concepts in structure and property control. *(On demand)*

ESGR 5164. Diffraction and Spectroscopic Studies of Matter. (3) (3G) Prerequisite: senior or graduate standing and consent of instructor. Atomic arrangements in crystalline and non-crystalline forms of matter. Symmetry properties of crystals. Treatment of diffraction theory and experimental methods. X-ray diffraction and spectroscopic analysis of matter. (*Alternate years*)

ESGR 5892. Individualized Study and Projects. (1-6) (1-6G) Individual investigation and exposition of results. May be repeated for credit. *(On demand)*

Graduate Only
ESGR 6090. Special Topics. (1-6G) Directed study of current topics of special interest. May be repeated for credit. *(On demand)*

ESGR 6101. Transport Processes. (3G) Prerequisite: consent of instructor. Unified field theory approach to the fluid transport of momentum, energy, mass and electrical charge. Statistical theories of turbulence and molecular transport. Multiphase systems, chemically reacting flows, ionized fluids, separation processes. *(On demand)*

ESGR 6102. Separation Processes. (3G) Prerequisite: consent of instructor. Theory of stagewise and continuous separation processes. Applications include distillation, extraction, absorption and thermal diffusion. *(On demand)*

ESGR 6103. Chemical Reaction Engineering. (3G) Prerequisite: consent of instructor. Theory and design of batch and flow chemical reactors. *(On demand)*

ESGR 6104. Nuclear Reactor Theory. (3G) Prerequisite: consent of instructor. Neutron transport theory applied to the engineering design of nuclear reactors. Generation, diffusion and slowing down of neutrons. Nuclear ballistics and collision phenomena. Reactor kinetics and thermodynamics. Homogenous and heterogenous reactors. *(On demand)*

ESGR 6166. Deformation and Fracture of Materials. (3G) Prerequisite: consent of instructor. Macroscopic and microscopic aspects of elastic and plastic deformation and fracture; applications of dislocation theory to an interpretation and control of mechanical properties; temperature, strain rate and texture effects. *(On demand)*

ESGR 6892. Individualized Study and Projects. (1-6G) Individual investigation and exposition of results. May be repeated for credit. *(On demand)*

ESGR 6991. Graduate Thesis Research. (1-6G) Individual investigation culminating in the preparation and presentation of a thesis. May be repeated for credit. *(Fall, Spring)*

ESGR 7999. Graduate Residence. (0) Required of all master's students not enrolled in other graduate courses who are working on or defending theses/projects and/or are scheduled for comprehensive examinations. (*Fall, Spring*)

FINANCE (FINN)

Undergraduate
FINN 2170. Personal Finance. (3) A course in the management of personal and family financial affairs. Topics include family financial planning and budgeting, saving for financial emergencies, consumer purchases and the use of credit, security and real estate investments, protection against premature death or disability, providing retirement income, insurance needs, income and estate tax planning. *(Spring)*

FINN 2171. Principles of Insurance. (3) A study of the different types of nonspeculative risks faced by individuals and businesses and the possible alternative methods of treating such risks. An examination of the specific application of these methods with regard to life, health, property, casualty and liability insurance contracts. *(On demand)*

FINN 2172. Real Estate. (3) A survey of problems involved in the acquisition, management and transfer of real estate. Topics include real estate contracts and leases; deeds, mortgages and other liens; real estate brokerage; appraisals and financing; taxation; and government regulations. (*On demand*)

FINN 3000. Topics in Finance. (3) Prerequisite: junior standing. Topics from the area of Finance. The course may be repeated for credit. (*On demand*)

FINN 3120. Financial Management. (3) Prerequisites: MATH 1120, STAT 1220; ACCT 2121, 2122, ECON 1201, 1202; junior standing. Principles and problems of financial aspects of managing capital structure, least-cost asset management, planning and control. Computer application will be included where appropriate. (*Fall, Spring, Summer) (Evenings)*

FINN 3220. Financial Analysis. (3) Prerequisite: FINN 3120; and for students majoring in Finance: MGMT 3160. Emphasis is on interpretation of financial statements and other data for internal management purposes and external commercial credit decisions. Practical application is stressed through use of business cases followed by video-taped verbal presentations and PC-generated hard-copy reports including graphics. (*Fall, Spring) (Evenings)*

FINN 3221. Financial Institutions and Markets. (3) Prerequisite: FINN 3120. A study of financial institutions and money and capital markets which considers their roles in the intermediation process. Special emphasis is focused on the comparative financial policies of financial institutions considered in the context of their market environments. *(Yearly)*

FINN 3222. Investments. (3) Prerequisite: FINN 3120. Major topics are security analysis and portfolio management. The viewpoint is that of the investment professional concerned with evaluation of individual securities and management of security portfolios. (*Fall, Spring) (Evenings)*

FINN 3223. International Financial Management. (3) Prerequisite: FINN 3120. Viewpoints are those of the senior financial officer of a corporation involved in international business and of the international officer of a commercial bank. Topics include the financing of exports and imports, financing of foreign operations, problems of foreign exchange rates and the impact of accounting

procedures on financial management. *(Fall, Spring, Summer) (Evenings)*

FINN 3224. Applied Business Finance. (3) Prerequisite: FINN 3120. Case study of the theories and techniques of financial management as they relate to the goal of the financial manager; the maximization of the value of the firm. Topics include financial planning, valuation, financial instruments, financial structure, and capital budgeting. *(Yearly)*

FINN 3225. Commercial Bank Management. (3) Prerequisite: FINN 3120. A study of sound and efficient techniques for the management of commercial banks. Topics include industry structure, administrative organization, and management of assets, liabilities and capital. *(Fall, Spring) (Evenings)*

FINN 3226. Financial Theory and Practice. (3) Prerequisite: FINN 3120. Modern financial theory and it's application, including risk theory, market equilibrium asset pricing models, efficient market theory, capital structure theory and applications (including issues surrounding financial distress and bankruptcy), dividend policy, agency problems, informational asymmetry, advanced topics in capital budgeting, and leasing. *(Yearly)*

FINN 3500. Cooperative Education Experience. (0) Enrollment in this course is required for the Department's cooperative education students during each semester they are working in a co-opposition. This course is restricted to majors in Finance. Course evaluation is Satisfactory/ Unsatisfactory. *(Fall, Spring, Summer)*

FINN 3800. Directed Study. (1-6) Prerequisites: consent of the Department and junior standing. Enrollment granted only by permission of the faculty with whom the work will be performed. The student's work assignments will be designed by the student and faculty member who will oversee the project of study. The credit hours will be determined prior to enrollment and will be based on the particular project undertaken. *(On demand)*

Graduate

FINN 6151. Financial Institutions and Markets. (3G) Major financial institutions, particularly commercial banks, and their role in the intermediation process and as suppliers of funds to the money and capital markets. Comparative financial policies of these institutions are examined in the context of their legal and market environment. (Same as MBAD 6151) *(Yearly)*

FINN 6152. Financial Management. (3G) Prerequisite: MBAD 6131. Theory and practice of corporate finance including asset management, cost of capital and capital budgeting, optimization problems and socio-economic aspects of financial management. Computer technology may be employed when applicable. (Same as MBAD 6152) *(Fall, Spring)*

FINN 6153. Investment Management. (3G) Prerequisite: MBAD 6152. Theory and practice of investment decisions of individuals and fund managers. Topics include the status of capital market theory, the efficient market hypothesis literature, and a portfolio performance measurement. Standard institutional and investment analysis topics, futures and options markets, and international investment topics are covered. (Same as MBAD 6153) *(Yearly)*

FINN 6154. Current Topics in Financial Management. (3G) Prerequisite: MBAD 6152. Examination of business finance topics currently being discussed in the business media and development of advanced analytical skills in those topic areas. Topics will change depending upon the business environment. The following topics form the basis of the course; lease vs. buy (borrow); leveraged buy-outs; merger analysis; international operations of American firms (capital budgeting); and capital structure decisions. (Same as MBAD 6154) *(On demand)*

FINN 6155. Multinational Financial Management. (3G) Prerequisites: MBAD 6111 and 6152. Financial management of the multinational firm including management of foreign exchange risk and political risk, and the control and evaluation of financial policies of multinational firms. (Same as MBAD 6155) *(Yearly)*

FINN 6156. Commercial Bank Management. (3G) Prerequisite: MBAD 6152. Techniques for the management of commercial banks. Topics of study include industry structure, administrative organization, management of assets, liabilities, and capital, and financial analysis of the banking firm. (Same as MBAD 6156) *(Yearly)*

FINN 6157. Theory of Corporate Finance. (3G) Prerequisite: MBAD 6152. Theories of modern corporate finance, including theory of efficient capital markets; uncertainty and the theory of choice; market equilibrium asset pricing models (capital asset pricing model, arbitrage pricing theory, Black-Scholes); theories of capital structure and the cost of capital; dividend policy; and leasing. (Same as MBAD 6157) *(Yearly)*

FOREIGN LANUGAUGE (FORL)

Languages in addition to those offered in the regular program may be available on demand. The number of credit hours for each course (3-4) is determined by the necessity or availability of a lab program.

Undergraduate

FORL 1201. Elementary Foreign Language. (3-4) Prerequisite: permission of the department. Fundamentals of grammar and phonetics, reading, writing and conversation of a selected language. *(On demand)*

FORL 1202. Elementary Foreign Language. (3-4) Prerequisite: FORL 1201 or permission of the department. Continuation of 1201. *(On demand)*

FORL 2201. Intermediate Foreign Language. (3-4) Prerequisite: FORL 1202 or permission of the department. Grammar review, conversation, composition and readings based on the culture and civilization. *(On demand)*

FORL 2202. Intermediate Foreign Language. (3-4) Prerequisite: FORL 2201 or permission of the department. Grammar, conversation, composition and readings based on students' needs. *(On demand)*

FORL 3050. Topics in Language, Literature and Culture. (WL) (3) Studies in a selected field of interest. May be repeated for credit. *(On demand)*

FORL 3160. European Cinema. (WA) (3) Prerequisites: Sophomore standing and ENGL 1102 or equivalent. Introduction to films of the various national cinemas of Europe and strategies for analyzing and discussing film critically and effectively. Lectures, discussions, viewing films, writing assignments, reviews, critiques and analyses. *(Spring, Fall)*

FORL 3800. Directed Individual Study. (1-3) Prerequisite: Permission of the department; normally open only to FL majors and minors. Individual work on a selected area of study. To be arranged with the instructor, generally during the preceding semester, and by special permission only. May be repeated for credit. *(On demand)*

Undergraduate/Available for Graduate Credit
FORL 4200. Secondary Methods--Foreign Languages. (3) (3G) Prerequisite: Completion of at least two 3000-level courses or equivalent in the target language, or permission of the department. Current trends and practices in teaching foreign and second languages in the middle school and high school, with emphasis on practical applications. Addresses state-mandated competencies. Required for licensure in the teaching of foreign language and recommended for licensure in teaching English as a Second Language. *(Fall) (Evenings)*

FORL 4201. Foreign Languages in the Elementary School Methods. (3) (3G) Prerequisite: completion of at least two 3000-level courses or equivalent in the target language, or permission of the department. Current trends and practices in teaching foreign and second languages in the elementary school, with emphasis on practical applications. Addresses state-mandated competencies. Required for licensure in the teaching of a foreign language and recommended for licensure in teaching English as a Second Language. *(Spring) (Evenings)*

FORL 4800. Directed Individual Study. (1-3) (1-3G) Prerequisite: permission of the department; normally open only to FL majors and minors. Individual work on a selected area of study. To be arranged with the instructor, generally during the preceding semester, and by special permission only. May be repeated for credit. *(On demand)*

FRENCH (FREN)

Undergraduate
FREN 1050. Special Approaches to the Study of French. (1-6) Course may be repeated with change of topic. *(On demand)*

FREN 1100. Elementary French I. (3) Prerequisite: may be taken for credit *only* by students with no previous experience in French. First course in a college-level sequence to develop competence in speaking, understanding, reading, and writing French, in a cultural context. *(Fall, Spring, Summer) (Evenings)*

FREN 1101. Elementary French II. (3) Prerequisite: FREN 1100 or equivalent. Second course in a college-level sequence to develop competence in speaking, understanding, reading and writing French, in a cultural context. The first course offered for students with previous experience in French. *(Fall, Spring, Summer) (Evenings)*

FREN 1102. Elementary French III. (3) Prerequisite: FREN 1101 or equivalent. Third course in a college-level sequence to develop competence in speaking, understanding, reading, and writing French, in a cultural context. *(Fall, Spring, Summer) (Evenings)*

FREN 2050. Topics in French. (1-3) Course may be repeated with change of topic. *(On demand)*

FREN 2201. Intermediate French I. (3) Prerequisite: FREN 1102 or equivalent. Review of grammar, reinforcement and expansion of competence in speaking, understanding, reading, and writing, in a cultural context. *(Fall, Spring)*

FREN 2202. Intermediate French II. (3) Prerequisites: FREN 2201 and 2201L, or permission of the department. Conversation and composition based on readings in French literature and culture. Film and slide presentations. *(Fall, Spring)*

FREN 2205. Business French. (3) Prerequisite: FREN 1202 or equivalent, or permission of the department. Written and oral exercises on the structure and phraseology of business French as well as routine messages and communications. Emphasis on commercial, banking, and telecommunication terminology. *(Spring)*

FREN 2207. French Phonetics. (3) Prerequisites: FREN 2202 or permission of the department. Study of the sounds of the French language, their production and representation by means of the International Phonetic Alphabet. Practice in reading and speaking with proper rhythm and intonation. *(Fall)*

FREN 2209. French Civilization. (WX) (3) Conducted in English. No knowledge of French required. Open to majors and non-majors for elective credit. A study of the French people, past and present, with emphasis on cross-cultural contrasts in attitudes and values. *(On demand)*

FREN 3050. Topics in French. (1-3) Course may be repeated with change of topic. *(On demand)*

FREN 3201. French Grammar and Conversation. (3) Prerequisite: FREN 2202 or permission of the department. Review of French grammar and guided conversation on prepared topics. Emphasis on spoken French. *(Fall)*

FREN 3202. French Grammar and Composition. (3) Prerequisites: FREN 2202 and 2207 or concurrent enrollment in FREN 2207. FREN 3201 recommended. Review of French grammar and guided compositions on prepared topics. Emphasis on vocabulary, idiomatic expressions, and stylistics. *(Spring)*

FREN 3203. Introduction to French Literature. (3) Prerequisites: FREN 2207 and 3201, or permission of the department. Development of techniques for literary study through analysis of selected major works in French literature. Readings, discussions, presentations, and *explications de texte. (Fall)*

FREN 3209. France Today. (3) Prerequisite: FREN 3201 or permission of the department. Contemporary France: institutions, society, culture. *(Spring)*

FREN 3800. Directed Individual Study. (1-3) Prerequisite: permission of the department; normally open only to FL majors and minors. Individual work on a selected area of study. To be arranged with the instructor, generally during the preceding semester, and by special permission only. May be repeated for credit. (*On demand*)

Undergraduate/Available for Graduate Credit

Additional work required for graduate credit.

FREN 4003. Studies in French Literature. (3) (3G) Prerequisite: FREN 3203, or permission of the department. Course may be repeated with change of topic. (*On demand*)

FREN 4005. Studies in the French Language. (3) (3G) Prerequisites: FREN 3201 and 3202, or permission of the department. Course may be repeated with change of topic. (*On demand*)

FREN 4007. Studies in French Culture and Civilization. (3) (3G) Prerequisites: FREN 3201, 3202, and 3209, or permission of the department. Course may be repeated with change of topic. (*On demand*)

FREN 4201. Survey of French Literature I. (3) (3G) Prerequisite: FREN 3203. The major literary movements from the Middle Ages to the Enlightenment, with sample texts. Emphasis on continuity and change. (*Fall*)

FREN 4202. Survey of French Literature II. (3) (3G) Prerequisite: FREN 3203. The major literary movements from the Enlightenment to the contemporary period, with sample texts. Emphasis on continuity and change. (*Spring*)

FREN 4800. Directed Individual Study. (1-3) (1-3G) Prerequisite: permission of the department; normally open only to FL majors and minors. Individual work on a selected area of study. To be arranged with the instructor, generally during the preceding semester, and by special permission only. May be repeated for credit. (*On demand*)

GEOGRAPHY (GEOG)

Undergraduate

GEOG 1101. World Regional Geography. (X) (3) A world regional study which emphasizes the distinctly human responses of people to various geographic situations throughout the world. The nature and development of cultural regions will be studied. (*Fall, Spring, Summer) (Evenings*)

GEOG 1105. The Location of Human Activity. (C) (3) An examination of factors which account for the locational characteristics of economic and other human activities. The locational decision-making process is examined as a means of understanding human spatial behavior. (*Fall, Spring, Summer*)

GEOG 2100. Maps and Graphs. (3) A study of cartography and its essential processes, with particular emphasis on the map as a communication system, the effective communication of data by means of graphical symbols, map interpretation and discussion of map production techniques. (*Fall, Spring) (Evenings*)

GEOG 2101. Cartographic Laboratory. (1) Prerequisite or corequisite: GEOG 2100. The laboratory emphasizes thematic mapping and design. This includes basic map construction techniques, including desktop mapping with computers. Two hours of laboratory per week. (*Fall, Spring) (Evenings*)

GEOG 2110. Introduction to Geographic Research. (3) Research design and resources in geographic research. Emphasis on spatial applications in summary statistics; spatial summaries, statistical hypothesis testing; sampling and estimation; association, correlation and regression. (*Fall, Spring) (Evenings*)

GEOG 2150. Geography of Polar Regions. (3) Arctic and Antarctic regions, history of exploration, the physical environment and political significance. (*Yearly*)

GEOG 2155. Geography of the U.S. and Canada. (3) Geographic structure of the U.S. and Canada with emphasis on physical environment and patterns of human activities. (*Fall*)

GEOG 2160. The South. (3) The culture, environment, population and economy of the southeastern U.S.; emphasis on current trends and future implications. (*Yearly*)

GEOG 2165. Patterns of World Urbanization. (C) (3) Introduction to cities of the world including examination of cities within different culture areas as well as the internal structure of different cities within the context of traditional and innovative theories of development geography. (*Fall, Spring, Summer*)

GEOG 3000. Topics in Regional Geography. (3) Examination of major geographical regions of the world. May be repeated for credit as topics vary. (*Yearly*)

GEOG 3100. The City and Its Region. (3) Study of the regional system of cities in terms of their size, spacing, historical evolution, functional relationships and future prospects. (*Fall, Spring*)

GEOG 3105. Geography of the Global Economy. (3) Examination of the globalization of economic activity with focus on the geographic patterns of international production, trade, and foreign direct investment and changes in these patterns resulting from actions by transnational corporations and nation states within a volatile technological environment. *(Spring)*

GEOG 3110. Urban Political Geography. (3) Spatial organization of metropolitan America. How metropolitan residents organize space into territorial units and the human, social and political ramifications of that organization. Spatial consequences of the most common modes of political, administrative and territorial organization. (*Alternate years*)

GEOG 3115. Urban Transportation Problems. (W) (3) Problems associated with moving goods, people and information in urban areas. Topics include mass transit and pollution problems. (*Alternate years*)

GEOG 3150. Manufacturing Geography. (3) Factors relating to the nature, locations and development of manufacturing industries. Emphasis upon classification of

manufacturers, principal areas of manufacturing and the role of manufacturing in regional development. *(Spring) (Evenings)*

GEOG 3200. Land Use Planning. (3) Land use planning, with emphasis on basic planning processes, implementation techniques and strategies, and issues confronting contemporary urban and rural planning. *(Spring)*

GEOG 3210. Regional Planning. (3) Introduction to regional planning strategies and approaches developed by regional planning agencies. Urban-regional planning relationships with emphasis on techniques used in regional analysis. *(Spring)*

GEOG 3215. Environmental Planning. (W) (3) Interaction and relationships between natural and human-made elements of the environment with emphasis on planning concepts and methodologies used in contemporary environmental planning. *(Fall)*

GEOG 3250. World Food Problems. (3) Magnitude, consequences, major causes and potential solutions to the world's food problems. *(On demand)*

GEOG 3260. Medical Geography. (3) Traditional aspects of medical geography including disease mapping, disease ecology and statistical association and more recent social scientific topics, including disease diffusion, health care facilities planning and spatial behavior. *(On demand)*

GEOG 3265. Behavioral Geography. (VW) (3) Behavioral approach to environmental decision-making, personal space, room and building geography, consumer behavior, territoriality, perception of wilderness and natural hazards, activity space, communication biases. *(Fall)*

GEOG 3500. Geography Cooperative Education Experience. (0) Enrollment in this course is required for the Department's geography cooperative education students during each semester that they are working. Evaluation is *Pass/No Credit. (Fall, Spring, Summer)*

GEOG 3501. Geography Cooperative Education Seminar. (1) This course is required of geography cooperative education students in each semester following a work assignment for presentation of geography reports on the co-op learning experience. *(Fall, Spring, Summer)*

Undergraduate/Available for Graduate Credit

Additional work required for graduate credit.

GEOG 4000. Selected Topics in Geography. (3) (3G) Prerequisite: consent of instructor. An intensive study of topics in geography from such areas as urban, manufacturing, retailing activity, transportation, and political geography. Topics vary from semester to semester. May be repeated for credit as topics vary. *(Yearly)*

GEOG 4100. Cartographic Techniques. (3) (3G) Prerequisite: GEOG 2100. Preparation of maps, figures and charts at a professional level of competence. Techniques to be emphasized include desktop mapping with computers, high resolution imagesetting output, color separation techniques which include computer separations as well as scribing and various related photographic processes. Two laboratories of three hours each per week. *(Spring)*

GEOG 4105. Cartographic Design and Map Construction. (3) (3G) Design process and basic map construction techniques with particular emphasis on the graphic elements of map design, planning map design, creating visual hierarchies, the uses of color, and basic mechanical color separation. *(Fall)*

GEOG 4110. Computer Mapping. (3) (3G) Prerequisites: GEOG 2100 and **CSCI** 1100 or 1201 and its lab, or consent of instructor. Automated methods of gathering, storing, manipulating and displaying spatial data. Emphasis on the use of existing software and the design and implementation of geographic data structures and algorithms. *(Spring)*

GEOG 4115. Introduction to Geographic Information Systems. (4) (4G) Prerequisite: consent of instructor. Development, current state-of-the-art and future trends in geographic information processing with emphasis on data gathering, storage, and retrieval, analytical capabilities and display technologies. A laboratory component will include development and completion of an applied GIS research project. Additional requirements for graduate credit. Three lecture hours, one two-hour lab per week. *(Fall)*

GEOG 4155. Retail Location. (3) (3G) Spatial attributes of retailing and related activities. Location patterns, store location research, trade area delineation and consumer spatial behavior. *(Spring)*

GEOG 4160. The Geography of Transportation Systems. (3) (3G) Geographical and human factors that affect the movement of goods and people from place to place. Emphasis on transportation routes and networks, commodity flow patterns and the locational implications of freight rates. *(Spring)*

GEOG 4205. Internal Structure of the City. (3) (3G) Integrative study of the spatial structure of cities with emphasis on land use patterns and models, transportation systems, residential concentrations, commercial activities and manufacturing zones. *(Fall, Spring, Summer)*

GEOG 4210. Urban Planning Methods. (3) (3G) Prerequisite: GEOG 4205 or consent of instructor. Scope and methods of urban planning. Emphasis on analytical techniques, projections, and data sources used in developing comprehensive planning tasks and strategies. *(Fall)*

GEOG 4255. Applied Population Analysis. (3) (3G) Population data sources; measuring population change; elementary projection and estimation techniques; spatial sampling; migration; survey design; applications in the public and private sectors. *(Fall)*

GEOG 4400. Internship in Geography. (3-6) (3-6G) Prerequisite: consent of the Department. Research and/or work experience designed to be a logical extension of a student's academic program. The student must apply to Department for an internship by submitting a proposal which specifies the type of work/research experience preferred and how the internship will complement his or her academic program. The student can receive three to six hours credit depending on the nature and extent of the internship assignment. *(On demand)*

GEOG 4800. Individual Study in Geography. (1-4) (1-4G) Permission of Department must be obtained and credit hours established in advance. Tutorial study or special research problems. May be repeated for credit. (*On demand*)

Graduate and Advanced Undergraduate

GEOG 5040. Transportation Topics. (3) (3G) Prerequisite: consent of department. Investigation of special topics in transportation including: transit systems, mobility and travel patterns, land use/transportation interface, air pollution, and information systems. *(Spring)* (*Alternate years*)

GEOG 5100. Transportation Policy Formulation. (3) (3G) Prerequisite: consent of department. Structure of transportation policy at federal, state and local levels including policies concerning highway financing and investments, congestion, safety, use and development, energy, transit, and the provision of intercity services. *(Fall)* (*Alternate years*)

GEOG 5105. Transportation Analysis Methods. (3) (3G) Prerequisite: consent of department; statistics recommended. Procedures for analyzing the operation and performance of transportation systems; includes network planning models, minimum path algorithms and assignments; energy, air pollution, and activity analysis models; and research approaches, data sources, time and activity budgets, infrastructure condition and needs assessment. *(Spring)* (*Alternate years*)

GEOG 5110. Evaluation of Transportation Impacts. (3) (3G) Prerequisite: consent of department. Methods and case studies for evaluating impacts and benefits of transportation investments including site-level impact analysis; project, corridor and area scales; multi-modal evaluation and examination of mutually exclusive alternatives. *(Fall)* (*Alternate years*)

GEOG 5115. Advanced Geographic Information Systems. (4) (4G) Prerequisite: GEOG 4115 or consent of instructor. Advance GIS study with emphasis on (1) advanced skills for database development and management; (2) spatial analysis and modeling. Workstation ARC/INFO will be used. Three lecture hours and a two-hour lab session each week. (*Spring*)

GEOG 5405. Urban Field Geography. (6) (6G) Prerequisite: six hours of urban-related undergraduate courses or permission of instructor. Intensive field studies of cities of the Carolinas, including one-day and overnight trips to cities of the mountains and coastal areas. Emphasis on day study trips within the Piedmont. Exercises include land-use mapping, trip journals, interviews and comparisons of the results of zoning and urban development practices within satellite cities of the Charlotte Metropolitan Statistical Area. (*Summer*)

Graduate Only

GEOG 6000. Topics in Economic Geography. (3G) Major topics in the location of economic activity. May be repeated for credit as topics vary. (*Yearly*) *(Evenings)*

GEOG 6005. Topics in Urban Geography. (3G) Major topics in the form and structure of urban areas examined generally and in a specific local occurrence. May be repeated for credit as topics vary. (*Yearly) (Evenings)*

GEOG 6010. Topics in Political Geography. (3G) Major topics in the spatial aspects of political systems with special emphasis on urban and regional spatial patterns examined generally and in a specific local occurrence. May be repeated for credit as topics vary. *(On demand)*

GEOG 6015. Topics in Regional Geography. (3G) Intensive examination of major spatial questions in a given region. May be repeated for credit as topics vary. *(On demand)*

GEOG 6020. Topics in Environmental Studies. (3G) Major topics concerning the physical environment with emphasis on pollution problems in urban areas examined generally and in a specific local occurrence. May be repeated for credit as topics vary. (*Yearly*) *(Evenings)*

GEOG 6025. Topics in Physical Geography. (3G) Major topics in physical geography examined generally and in a specific local occurrence. May be repeated for credit as topics vary. (*Yearly*) *(Evenings)*

GEOG 6030. Topics in Geographic Techniques. (3G) Cartographic, remote sensing, quantitative techniques or field techniques. May be repeated for credit as topics vary. *(On demand)*

GEOG 6100. Quantitative Analysis in Geography. (3G) Multiple regression, trend surface, factorial analysis, cluster analysis, discriminant analysis. *(Fall) (Evenings)*

GEOG 6101. Store Location Research. (3G) Prerequisite: GEOG 6100 or consent of instructor. Market area analysis and site evaluation methods, including the application of multivariate statistical models, spatial interaction-gravity models, and location-allocation techniques to the retail location analysis task. *(Spring)*

GEOG 6102. Site Feasiblity Analysis. (3G) Prerequisite: consent of instructor. Examination of factors affecting the feasibility of land parcels for commercial and residential development with emphasis on the physical evaluation of a given site, the market support for its intended use and the financial support for the proposed development. *(Fall)*

GEOG 6106. Urban Planning: Theory and Practice. (3G) Alternative planning theories and application of theories in urban planning practices. (*Alternate years*)

GEOG 6110. Cartographic Preparation and Analysis. (3G) Cartographic design and analysis of qualitative and quantitative data. Emphasis on preparation of maps, figures and charts. Techniques include scribing and various photographic processes. Two three-hour labs each week. *(On demand)*

GEOG 6200. Research Design Fundamentals. (3G) Scientific research and problem solving. Problem identification, bibliographic search, data sources and collection, techniques selection and preparation of reports and proposals. *(Spring) (Evenings)*

GEOG 6201. Analysis and Presentation of Research Data. (3G) The student is required to complete a research

project. Topics such as research critiques, preparation and presentation of research reports, and the development of geographic thought are considered. *(Fall) (Evenings)*

GEOG 6600. Seminar in Geography. (3G) Study of the current trends in geographic thought and research methods. *Pass/No Credit* grading. *(On demand)*

GEOG 6615. Advanced Seminar in Spatial Decision Support Systems (SDSS). (4G) Prerequisite: GEOG 4115 or consent of instructor. Theoretical aspects of spatial DSS including technical, social, political and psychological consideration; systems design; systems manipulation; and case studies. Three hours of lecture and one two-hour lab per week. *(Fall)*

GEOG 6800. Directed Problems in Geography. (1-4G) Individual research into geographic topics. May be repeated one time. *(On demand)*

GEOG 7900. Individual Research Project. (6G) Individual research report based on directed study of a topic of geographic significance. *Pass/No Credit/ Unsatisfactory* grading. *(Fall, Spring)*

GEOLOGY (GEOL)

Undergraduate

GEOL 1200. Physical Geology. (S) (3) A study of the basic geological principles and processes in earth science; the earth as a planet; treatment of physical processes shaping the earth; earth materials and landforms. *(Fall, Spring, Summer) (Evenings)*

GEOL 1200L. *Physical Geology Laboratory. (S) (1) Prerequisite or corequisite: GEOL 1200. Experimental study and investigation of the basic geological principles and processes in earth science; minerals, rocks, earth materials, and landforms. One lab period of three hours per week. Off-campus field trip required. *(Fall, Spring, Summer) (Evenings)*

**Although the laboratory and lecture sections of GEOL 1200 are taught as separate courses it is recommended that students take GEOL 1200L concurrently with GEOL 1200. Students with scheduling problems or students not fulfilling the UNC Charlotte science and technology requirements may take the lecture without the laboratory. Students fulfilling the UNC Charlotte science and technology requirement must either: (a) take GEOL 1200 and GEOL 1200L concurrently or (b) take GEOL 1200L in a semester subsequent to taking GEOL 1200.*

GEOL 1210. Earth History. (S) (4) Prerequisites: GEOL 1200, 1200L. The origin and evolution of the earth's major features: the beginnings and changes of the earth's continents, atmosphere, oceans, life forms, set in the vast context of geologic time. Three hours of lecture, three hours of lab per week. Off-campus field trip required. *(Spring)*

GEOL 2100. The Violent Earth. (3) Volcanoes, earthquakes, hurricanes, tornadoes, floods and other catastrophic natural phenomena with emphasis on causes, effects and human adjustments. *(Fall)*

GEOL 3000. Selected Topics in Geology. (1-4) Prerequisite: GEOL 1200-1200L, or permission of the instructor. Treatment of specific topics selected from one of the fields of geology. May be repeated for credit as topics vary. *(On demand)*

GEOL 3110. Minerals and Rocks. (3) Prerequisites or corequisites: GEOL 1200 and 1200L. Formation processes, composition and identification of rocks and minerals in the earth's crust with important abundance or special use. *(On demand)*

GEOL 3115. Mineralogy. (4) Prerequisite: GEOL 1200. Prerequisite or corequisite: CHEM 1251-1251L or consent of the instructor. Identification, classification and description of minerals based on physical properties, crystallography, and chemical composition. Includes diagnostic techniques for identification of common ore and rock forming minerals. Three hours of lecture and one three-hour lab per week. *(Fall)*

GEOL 3120. Geochemistry. (3) Prerequisites: GEOL 1200, 1200L and Chemistry 1251 or consent of instructor. Geochemical survey of origin, evolution and present composition of the earth. *(Alternate years)*

GEOL 3120L. Geochemistry Laboratory. (1) Prerequisiteor corequisite: GEOL 3120 or consent of instructor. Analytical methods and sample preparation techniques used by geochemists. One three hour meeting per week. *(On demand)*

GEOL 3124. Sedimentology. (W) (4) Prerequisites: GEOL 1210, 3115 or consent of instructor. Examination of sedimentary rock features and compositions as related to origin, dispersion, deposition, diagenesis, classification and general distribution of sedimentary materials. Three hours of lecture and one three-hour lab per week. *(Fall)*

GEOL 3130. Structural Geology. (4) Prerequisite: GEOL 3115 or consent of the instructor. A systematic examination of the structures and processes of rock deformation. Three lecture hours, one three-hour lab per week. *(Fall)*

GEOL 3140. Paleontology. (3) Prerequisite: GEOL 1200, 1200L and 1210, or permission of the instructor. Nature of fossils, analysis of growth and variation in fossil assemblages, reconstruction of the modes of life of extinct organisms, paleobiogeography, biostratigraphy, and the fossil record of evolutionary pattern and processes. *(On demand)*

GEOL 3190. Environmental Geology. (3) Prerequisites: GEOL 1200, 1200L. Aspects of geology with direct or indirect impact on society. Topics include slope stability, earthquake hazards, solid waste disposal, flooding, ground water problems, soil loss, sediment pollution, watershed dynamics, water and soil pollution, and radioactive waste disposal. *(On demand)*

GEOL 3190L. Environmental Geology Laboratory. (1) Prerequisite or corequisite: GEOL 3190. Investigation of the causes, consequences, and mitigation of natural hazards and disasters. One three-hour lab per week. *(On demand)*

Undergraduate/Available for Graduate Credit

Additional work required for graduate credit.

GEOL 4000. Selected Topics in Geology. (1-4) (1-4G) Prerequisites: ESC1 1101, GEOL 1200-1200L, or

permission of the instructor. In-depth treatment of specific topics selected from one of the fields of geology. May be repeated for credit as topics vary. *(On demand)*

GEOL 4100. Igneous and Metamorphic Petrology. (4) (4G) Prerequisite: GEOL 3115. Classification, mineralogy and chemical properties of igneous and metamorphic rocks including the tectonic processes by which they formed. Lab emphasizes hand specimen and petrographic description and interpretation of rocks in thin sections. (*Alternate years*)

GEOL 4105. Geomorphology. (3) (3G) Prerequisites: ESCI 1101; GEOL and 1200L. Surficial processes and landform development as controlled by climate, tectonics, rock characteristics and time with emphasis on plate tectonic, weathering, erosion, mass wasting, surface water, groundwater, glacial, wind and coastal processes and climate change in landscape development. *(Fall)(Alternate years)*

GEOL 4105L. Gemorphology Laboratory. (1) (1G) Prerequisite or corequisite: GEOL 4105. Analysis of landforms and the surficial processes responsible for landform development. One lab period of 3 hours per week. *(Fall)(On demand)*

GEOL 4110. Stratigraphy. (4) (4G) Prerequisites: GEOL 1210 and 3124. Vertical and horizontal relationships of layered earth materials as a key to understanding basin history, past depositional environments and their transformation through time. Three lecture hours, three lab hours per week. (*Spring)*

GEOL 4115. Applied Geophysics. (4) (4G) Prerequisites: GEOL 3115, 3130 and introductory physics or consent of instructor. Instrumental analysis of the earth's physical parameters. Study of human-induced seismic and electrical signals, and natural magnetic and gravitational fields for the purposes of locating faults, ore bodies, ground water and other earth hazards or resources. Three hours of lecture and one two-hour lab per week. (*On demand*)

GEOL 4120. Geologic Mapping and Interpretation. (4) (4G) Prerequisites: GEOL 3130 and 4100 or consent of instructor. Field and lab oriented study using principles of mineralogy, petrology and structural geology. Involves collection and resolution of field data, techniques of presenting data, development of geologic maps, and critical reviews of existing literature. Two hours of lecture, four hours of lab/field work per week. (*Alternate years*)

GEOL 4125. Geologic Summer Field Camp. (6) (6G) Prerequisite: junior standing and consent of instructor. Concentrated field investigation of geologic features. Data collection in the field, geologic mapping, report and map preparation and time management. Location of field camp will be specified each time course is offered. (*Summer*)

GEOL 4130. Optical Mineralogy. (4) (4G) Prerequisite: GEOL 3115. Light optics theory, the behavior of plane polarized light in a solid medium. The laboratory emphasizes the use of petrographic microscope oil immersion techniques and identification of the common rock forming minerals. Three hours of lecture and one three-hour lab per week. (*Spring*)

GEOL 4135. Tectonics. (4) (4G) Prerequisite: GEOL 3130 or consent of the instructor. A systematic examination of the evolution and dynamics of the earth from the perspective of plate tectonics theory. Three lecture hours, one three-hour lab per week. (*Alternate years*)

GEOL 4145. Fundamentals of Hydrogeology. (3) (3G) Prerequisites: GEOL 1200, CHEM 1252 or consent of instructor. Physical and chemical principles of ground water including the framework of ground water within the geologic and hydrologic cycles, its exploitation and protection as a natural resource, and its importance as a resource in the southeastern United States. (*On demand) (Evenings)*

GEOL 4145L. Hydrogeology Laboratory. (1) (1G) Prerequisites: GEOL 1200, CHEM 1252, MATH 1242, PHYS 1101 and GEOL 4145 (or corequisite) or consent of instructor. Ground water investigation and analysis. Topics include storage of water in rocks, movement and chemical evolution of ground water, and assessment of regional ground water conditions. One three-hour lab per week. (*On demand) (Evenings)*

GEOL 4400. Internship in Geology. (3-6) (3-6G) Prerequisite: consent of the department. Research and/or work experience designed to be a logical extension of a student's academic program. The student must apply to the department for an internship by submitting a proposal which specifies the type of work/research experience preferred and how the internship will complement his or her academic program. The student can receive three to six hours credit depending on the nature and extent of the internship assignment. *(On demand)*

GEOL 4800. Individual Study in Geology. (1-4) (1-4G) Prerequisite: Permission of the Department and credit hours established in advance. Tutorial study or special research problems. May be repeated for credit as topics vary. *(On demand)*

GEOL 6651. Workshops in Geology. (4G) A series of lectures on subject matter of the lithosphere and space science with accompanying laboratory sessions. *(On demand)*

GERMAN (GERM)

Undergraduate

GERM 1100. Elementary German I. (3) Prerequisite: may be taken for credit *only* by students with no previous experience in German. First course in a college-level sequence to develop competence in speaking, understanding, reading, and writing German, in a cultural context. *(Fall, Spring, Summer) (Evenings)*

GERM 1101. Elementary German II. (3) Prerequisite: GERM 1100 or equivalent. Second course in a college-level sequence to develop competence in speaking, understanding, reading and writing German, in a cultural context. The first course offered for students with previous experience in German. *(Fall, Spring, Summer) (Evenings)*

GERM 1102. Elementary German III. (3) Prerequisite: GERM 1101 or equivalent. Third course in a college-level sequence to develop competence in speaking, understanding, reading, and writing German, in a cultural context. *(Fall, Spring, Summer) (Evenings)*

GERM 2201. Intermediate German I. (3) Prerequisite: GERM 1102 or equivalent. Review of grammar, reinforcement and expansion of competence in speaking, understanding, reading, and writing, in a cultural context. *(Fall, Spring)*

GERM 2202. Intermediate German II. (3) Prerequisite: GERM 2201 or permission of the department. Continuation of GERM 2201. Review of grammar, composition and conversation, based upon readings on the culture and civilization of German-speaking countries. Students who wish to continue with advanced offerings in German are advised to complete GERM 2202. (*Fall, Spring*)

GERM 3030. Studies in German Culture. (A) (3) Prerequisite for German major: satisfactory completion of GERM 2202 or equivalent. Conducted in English. No knowledge of German required. A study of the life and thought of German-speaking people both past and present. Course topic will concentrate on a geographical area, a particular cultural institution or a particular period. May be repeated as topic changes. (*Alternate years*)

GERM 3050. Studies in German Literature. (L) (3) Prerequisite for German major: satisfactory completion of GERM 2202 or equivalent. Conducted in English. No knowledge of German required. May be repeated as topic changes. (*Yearly*)

GERM 3160. Survey of German Film. (WA) or (WX) (3) Prerequisite: sophomore status and ENGL 1102. Introduction to major movements in German film history taught in English. Lectures, group discussions, viewing of films (in whole and in part), and a variety of writing assignments. (For students seeking to apply this course toward requirements for the German major or minor there is a prerequisite of four semesters of German or the equivalent and a co-requisite of GERM 4050 (1).) *(On demand)*

GERM 3201. Advanced German Grammar, Composition and Conversation I. (3) Prerequisite: GERM 2202 or permission of the department. For prospective teachers of German and students who want intensive oral and written work in the language. Three class hours per week and lab work as assigned by instructor. (*Yearly*)

GERM 3202. Advanced German Grammar and Composition II. (3) Prerequisite: GERM 2202 or permission of the department. Intensive review of German grammar. Discussion of prepared topics drawn from newspapers and periodicals. Three class hours per week and laboratory work as assigned by instructor. (*Yearly*)

GERM 3210. Business German. (3) Prerequisite: GERM 2202 or equivalent. Introduction to the spoken and written language of the German business world; formalities and conventions of business correspondence, import/export, economics, and commercial transactions. (*Alternate years*)

GERM 3800. Directed Individual Study. (1-3) Prerequisite: permission of the department; normally open only to FL majors and minors. Individual work on a selected area of study. To be arranged with the instructor, generally during the preceding semester, and by special permission only. May be repeated for credit. (*On demand*)

Undergraduate/Available for Graduate Credit

Additional work required for graduate credit.

GERM 4010. Periods in the History of German Literature. (3) (3G) (a) Medieval literature, (b) Classicism, (c) Romanticism, (d) Nineteenth Century, (e) Contemporary literature. Prerequisites: two 3000-level courses or permission of the department. Study of the major writers and works in a given period. Readings, lectures and reports. May be repeated for major credit with change of topic. (*Alternate years*)

GERM 4020. The Chief Genres in German Literature. (3) (3G) (a) Novel, (b) Theater, (c) Lyric poetry, (d) short prose fiction. Prerequisites: two 3000-level courses or permission of the department. An analysis of a major genre and its development within German literary history. Readings, lectures and reports. May be repeated for major credit with change of topic. (*Alternate years*)

GERM 4050. Special Topics in German. (1-3) (1-3G) Prerequisite: one 3000-level course or permission of the instructor. Treatment of a special group or figure in German literature, specialized topic in German culture or language, or special problems in German conversation. May be repeated for credit with change of topic. (*Fall, Spring, Summer*)

GERM 4203. Survey of German Literature I. (3) (3G) Prerequisites: two 3000-level courses or permission of the department. General introduction to German literature from the Middle Ages to the Classical Period. Book reports and class discussion on collateral readings. (*On demand*)

GERM 4204. Survey of German Literature II. (3) (3G) Prerequisite: two 3000-level courses or permission of the department. German literature since Classicism. Book reports and discussions on collateral readings. (*On demand*)

GERM 4800. Directed Individual Study. (1-3) (1-3G) Prerequisite: permission of the department; normally open only to FL majors and minors. Individual work on a selected area study. To be arranged with the instructor, generally during the preceding semester, and by special permission only. May be repeated for credit. (*On demand*)

GREEK (GREK)

Undergraduate

GREK 1201. Elementary Ancient Greek I. (4) Beginning survey of elementary Ancient Greek grammar through selected readings. *(Alternate years)*

GREK 1202. Elementary Ancient Greek II. (4) Prerequisites: GREK 1201 or equivalent. Completion of the survey of elementary Ancient Greek grammar; connected readings in elementary to intermediate Biblical and Attic prose. *(Alternate years)*

GREK 3800. Directed Individual Reading. (1-3) Prerequisite: permission of instructor. Individual work on an author or genre to be arranged with the instructor. *(On demand)*

GERONTOLOGY (GRNT)

Undergraduate

GRNT 2100. Introduction to Gerontology. (C) (3) An interdisciplinary course that examines the phenomenon of aging and its consequences for society from a variety of perspectives. Students participate in lectures, discussions and meetings with community-based professionals; designed to give them a broad overview of the field of gerontology. Emphasis on the wide variation in the aging process and the significant programs and services designed to meet the needs of the aging population. *(Fall, Spring)*

GRNT 2124. Psychology of Adult Development and Aging. (C) (3) Psychological development through adulthood and old age. Emphasis on processes underlying continuity and change in adulthood, including personality and socialization, cognitive development and the psychophysiology of aging. (Same as PSYC 2124) *(Spring)*

GRNT 3100. Health and the Aging Process. (3) Examination of the physiologic processes of aging as a normal life experience. Study of psychological, nutritional and general health issues designed to facilitate high-level wellness. *(Same as NURS 3115)(Spring)*

GRNT 3600. Senior Seminar and Field Experience in Aging. (W) (4) Prerequisites: completion of 15 hours in Gerontology curriculum including GRNT 2100, GRNT 3100/NURS 3115, GRNT/PSYC 2124 and GRNT/SOCY 4110. Capstone course for the minor in Gerontology designed to help students apply theories, research methods, and specific intervention strategies to substantive issues, and critically examine the organizational structure of aging programs and policies. Two seminar hours and six field placement hours per week. *(Spring)*

GRNT 3800. Individual Study in Gerontology. (1-8) Prerequisite: permission of the instructor and the gerontology program coordinator. Supervised individual study and/or field-based experience in a topic or area of gerontology of particular interest to the student. May be repeated for credit but only a total of 4 credit hours can count towards a Gerontology minor. *(On demand)*.

Undergraduate/Available for Graduate Credit

GRNT 4050. Topics in Gerontology. (1-4) (1-4G) Investigation of specific issues in Gerontology, either from the perspective of a single discipline or from a multidisciplinary perspective. May be repeated for credit as topics vary. *(On demand)*

GRNT 4110. Sociology of Aging. (3) (3G) Prerequisite: SOCY 1101 or consent of the instructor. Changing characteristics, aspirations and needs of older adults and their impact upon such institutions as the family, work, the economy, politics, education and health care; emphasis on sociological theories of aging, contemporary research, and the analysis of specific aging policies and programs. (Same as SOCY 4110) *(Fall, Summer)*

GRNT 4250. Aging Policy and Programs. (3) (3G) Public policy for older adults in the U.S. Examination of federal, state and local framework of services and programs for the aging. Graduate students required to complete a more extensive final paper and to present their project presentation as a grant proposal. *(Yearly)*

GRNT 4260. Women and Aging. (3) (3G) Position of older women in society and the particular problems of and issues for women as they age. (The same as WMST 4260.) *(Yearly)*

GRNT 4270. Intergenerational Relationships & Programs. (3) (3G) Exploration of the importance and consequences of intergenerational relationships and the range of programming currently available to encourage interaction between people of different ages. *(On demand)*

Graduate Only

GRNT 6201. Research & Methods on Aging I. (3G) Prerequisite: Statistics. Qualitative and quantitative methods used in research on aging and analysis of Gerontology research from a range of disciplines. Thesis students will develop the plan for their project. *(Fall)*

GRNT 6202. Research & Methods on Aging II. (3G) Continuation of GRNT 6201. Thesis students will complete their thesis proposal and non-thesis students will complete an applied research project culminating in a research paper. *(Spring)*

GRNT 6210. Aging and Public Policy. (3G) Examination of the public policy making process with attention to aging policy including determinants of aging policy and institutions and actors in the policy making process. (The same as MPAD 6210.) *(Alternate years)*

GRNT 6211. Administration of Aging Programs. (3G) Implementation of public policies and programs for the aged and the development and administration of these programs, including the process through which policies are transformed into aging programs and the budgetary, management and evaluative considerations that must be taking into consideration. (The same as MPAD 6211.) *(Alternate years)*

GRNT 6238. Intergenerational Issues of Justice. (3G) Examination of intergenerational issues of justice in public policy toward the elderly and their health care needs. Issues of justice and morality in the distribution of limited health care resources among competing age-groups. (The same as PHIL 6238.) *(Yearly)*

GRNT 6400. Practicum. (3G) Completion of a field-based educational experience which relates to the student's career goals and objectives. *(On demand)*

GRNT 6600. Current Issues in Gerontology. (3G) Study of current topics and issues in the field of Gerontology from

an interdisciplinary perspective and using an ethical framework. *(Fall)*

GRNT 6800. Directed Readings/Research in Gerontology. (3G) Prerequisite: prior written consent of the instructor, of the Gerontology Coordinator, and of the student's academic adviser. Graduate students meet individually or in small groups with the instructor and will be assigned readings and/or research on a topic in Gerontology. Attendance at lectures of an undergraduate class in Gerontology may be included among course requirements. May be repeated for credit up to a maximum of six hours. *(On demand)*

GRNT 6999. Master of Arts Thesis. (3G or 6G) Prerequisite: application for admission to the thesis option. A completed paper and oral presentation are required. *(Fall, Spring, Summer)*

MASTER OF HEALTH ADMINISTRATION (HADM)

HADM 6000. Topics in Health Administration. (3G) Intensive study of a topic in health administration. May be repeated for credit as topics vary. *(On demand/evenings)*

HADM 6103. Health and Disease. (3G) Principles and methods of epidemiology including definitions and models of health, illness and disease; modes of transmission of clinically important infectious agents; risk factors and chronic diseases; and insights into existing studies and paradigms of health promotion and disease prevention. *(Same as HLED 6189) (Spring)*

HADM 6112. Introduction to the U.S. Health Care System. (3G) Overview of health care delivery in the United States including organizational structures, financing mechanisms and delivery systems, with particular attention to program formation. (Same as MPAD 6172) *(Yearly) (Evenings)*

HADM 6114. Economics of Health Policy. (3G) Examination of the economic context of health care policy and application of economic concepts to the health care sector including supply and demand, elasticity, regulation, competition and cost effectiveness analysis. *(Yearly) (Evenings)*

HADM 6123. Accounting for Health Care Management. (3G) Prerequisite. Undergraduate accounting course. Basic concepts and techniques of collecting, processing and reporting financial information relevant to health care institutions. Emphasis on conceptual understanding of financial accounting technical tools of cost accounting, including budget preparation and analysis, and interpretation of financial statements. *(Yearly) (Evenings)*

HADM 6125. Finance in Health Care Administration. (3G) Prerequisite: Undergraduate accounting course. Fundamental financial management concepts and tools for health care institutions; including financial statements and attributes, capital acquisition and allocation, investment analysis, capital and cash flow management and contractual relationships. *(Yearly) (Evenings)*

HADM 6127. Health Policy Development. (3G) Examination of the formulation, adoption and implementation of public policy for health care through federal, state and local political processes. (Same as MPAD 6174) *(On demand) (Evenings)*

HADM 6130. Health law and Ethics. (3G) Analysis of ethical and bioethical problems confronting health care delivery systems. Selected legal principles and their application to the health care field, including corporate liability, malpractice, informed consent and governmental regulation of health personnel and health facilities. *(Yearly) (Evenings)*

HADM 6133. Trends and Issues in Health Administration. (3G) Examination of current issues confronting health care managers and an assessment of programs and management responses to emerging trends in the health care field, including deliery systems, marketing/competition, financing and/or epidemiological changes. (Same as MPAD 6176) *(On demand) (Evenings)*

HADM 6135. Managed Care Systems. (3G) Fundamentals of managed health care systems, including risk arrangements, compensation, incentives, quality assurance, financing and public programs. *(On demand) (Evenings)*

HADM 6141. Research Methods for Health Care Administration. (4G) Prerequisite: Basic statistics course. Statistical techniques for analysis of managerial decisions and interpretation and evaluation of research. Introduction to systems analysis and selected operations research techniques as applied to problem solving and decision making in health care institutions. *(Yearly) (Evenings)*

HADM 6145. Organization Theory and Leadership. (3G) Introduction to organizational theory with applications to health care systems, including organizational design and interorganizational networks/alliances. Communication and leadership skills development, including conflict, labor and dispute management. *(Yearly) (Evenings)*

HADM 6147. Human Resources Management. (3G) Examination of human resource management as it applies to health care institution, including compensation, benefits, personnel planning, recruitment, selection, training and development, employee appraisal and discipline, union management relations and quality management. (Same as MPAD 6134) *(Yearly) (Evenings)*

HADM 6166. Strategic Management of Health Services Organizations. (3G) Analysis of strategic planning, managing and marketing concepts, techniques and tools within the health care industry, including orgnaizational capability analysis, competitor and environmental analysis and business plan development. *(Yearly) (Evenings)*

HADM 6800. Independent Study. (1-3G) Guided individual study of an issue related to health administration arranged with a faculty member or supervised experience in an administrative setting in program or entity within the health care delivery system. *(On demand)*

HADM 6999. Thesis. (3G) Production of independent research relevant to health administration which demonstrates contribution to professional knowledge through systemic investigation. Pass/In Progress grading. *(On demand)*

HADM 7999. Graduate Residence. (0G) Prerequisite: HADM 6999. Required for master's students not enrolled in other courses who are working on or defending theses and/or are scheduled for comprehensive examination. *(Fall, Spring)*

HISTORY (HIST)

Undergraduate

HIST 1100. The World in the 20th Century. (VX) (3) Outstanding recent world developments in an historical context. *(Fall, Spring)(Evenings)*

HIST 1115. The Ancient Mediterranean World. (A or X) (3) Survey of the ancient history of the Near East, Egypt, Greece, and Rome from c. 3000 B.C. to the 5th c. A.D. emphasizing historical information drawn from art and material culture. *(Fall)*

HIST 1120. European History to 1660. (X) (3) Political and cultural developments of Western Europe from the fourth century A.D. to the Age of Absolutism. *(Fall, Spring, Summer)*

HIST 1121. European History Since 1660. (X) (3) European history from the Age of Absolutism to the present. *(Fall, Spring, Summer)*

HIST 1160. U.S. History I. (C) (3) American history from the earliest times to 1865. *(Fall, Spring, Summer)*

HIST 1161. U.S. History II. (C) (3) American history from 1865 to the present. *(Fall, Spring, Summer)*

HIST 2000. Topics in History. (V) (3) Treatment of an historical topic. May be repeated for credit as topics vary. *(Yearly)*

HIST 2100. Introduction to Historical Studies. (3) A writing-intensive experience involving primary and secondary sources, library research, historical evidence, citation, rhetoric and modern methodology. *(Fall, Spring, Summer)(Evenings)*

HIST 2101. American Business History. (3) A survey of the origins, methods, and goals of modern business enterprise. Lectures emphasize the social history of the American business community and the relation between public policy and economic growth. Discussion emphasizes current economic problems and policies. *(Spring)*

HIST 2110. Technology and Science in Society I: To 1776. (3) The history of science and technology up to the British industrial revolution of the 18th century. The impact of scientific and technological change on Western societies and societal influence on the development of science and technology. Scientific and technical background is not a prerequisite. *(Fall)*

HIST 2111. Technology and Science in Society II: Since 1776. (VC) (3) The history of science and technology in Western society since the industrial revolution of the 18th century. The inter-connections of science and technology with society, with particular emphasis on the United States. Designed for all students, regardless of scientific and technical background. *(Spring)*

HIST 2120. American Military History. (3) A survey of the development and organization of military practice from the colonial period to the present. *(Spring)*

HIST 2130. Introduction to Historic Preservation. (3) Techniques available in the United States to identify and preserve historically significant structures, buildings, sites, areas and objects. *(Fall)*

HIST 2140. Disease and Medicine in History. (3) Development of medical knowledge, trends in the techniques and availability of medical and psychiatric care, and the impact of disease and medicine on selected problems in world history. *(Spring)*

HIST 2150. History of Women in the U.S. (3) Changing experience, status and role of women from colonial times to the present. *(Alternate years)*

HIST 2200. Asian Civilization. (L) (3) An investigation of the philosophical, religious, social, political and economic foundations of the great Asian civilizations. Emphasis will be placed on understanding those traditions that influence Asian societies today and a comparison of those traditions to Western traditions. *(Fall)*

HIST 2201. History of Modern Asia. (3) Focus on the rise of modern Asia from the period just prior to the armed intervention of Western European nations. Emphasis will be placed on the impact of imperialism, colonialism and the rise of Asian nationalism on Asian societies. *(Spring)*

HIST 2206. Colonial Latin America. (X) (3) A survey of major political, economic, and cultural developments from earliest times to 1826. *(Fall)*

HIST 2207. Modern Latin America. (X) (3) A survey of Latin American history from 1826 to the present with emphasis on the economy and society. Special attention to twentieth-century revolutions and the role of the United States in Latin America. *(Spring)*

HIST 2210. Pre-Colonial Africa. (3) A survey of major political, economic and religious developments in Sub-Saharan Africa from earliest times to the early 19th century. *(Fall)*

HIST 2211. Modern Africa. (3) A survey of major developments in 19th and 20th century Sub-Saharan Africa, with emphasis on the European conquest, the colonial period, and the triumph of modern African nationalism. *(Spring)*

HIST 2250. Russian History from Earliest Times to 1801. (3) Development of the Russian people, focusing upon the rise and fall of the Kievan state, the impact of the period of Tartar domination, the rise of Moscovy, and the growth of the Tsarist autocracy before the reign of Alexander I. *(Alternate years)*

HIST 2251. Russian History from 1801 to 1917. (3) Decline and fall of the Tsarist empire, focusing upon the

efforts of the last four rulers to perpetuate the monarchy and upon the factors working against the effort. (*Alternate years*)

HIST 2252. Russian History from 1917 to the Present. (3) Development of Soviet Russia, focusing upon the October 1917 Revolution, Lenin's years of rule, Stalin's rise to power, the Five Year Plan and the years since World War II. (*Alternate years*)

HIST 2260. Britain to 1688. (C) (3) British history with emphasis on institutional, cultural, and economic developments. (*Alternate years*)

HIST 2261. Britain since 1688. (3) Continuation of HIST 2260 with some treatment of the British Empire. (*Alternate years*)

HIST 2270. France, 1643-1815. (3) A survey from the development of royal absolutism to the French Revolution and Napoleonic conquests. (*Alternate years*)

HIST 2271. France, 1815 to the Present. (3) A study of France through the period of the Paris Commune, the two World Wars, and the current crisis of the modern world. (*Alternate years*)

HIST 2280. The Emergence of Modern Germany. (3) A political survey to the mid-19th century, emphasizing the dual role of Prussia and Austria in the German world. (Alternate years)

HIST 2281. Twentieth Century Germany. (3) The Wilhelmine Empire, the Wiemar Republic, the Third Reich and the two Germanies. (*Alternate years*)

HIST 2284. A Military History of World War II. (3) Major campaigns of World War II with emphasis upon the European theater of operations. (*Alternate years)*

HIST 2285. World War II: The Pacific Theater. (3) A description and analytical survey of the military campaigns in the Pacific theater of operations. (*Alternate years)*

HIST 2297. History of North Carolina, 1500 to the Present. (3) An overview of North Carolina's historical development focusing on the social, economic and political events that have shaped the state (*Fall, Spring*)

HIST 2400. History Internship. (1-3) Applied historical techniques utilizing modern methodology and experiences in off-campus institutions or on historical sites. May be repeated for credit. (*On demand*)

HIST 2700. Honors in History. (3) Prerequisite: consent of instructor. Treatment of historical topic. May be repeated for credit as topics vary. (*On demand*)

Advanced Undergraduate

HIST 3000. Topics in History. (3) Treatment of historical topic. May be repeated for credit as topics vary. (*Yearly*)

HIST 3101. History of Greece. (L) (3) From the beginning of civilization in Greece to the 1st Century B.C. (*Alternate years*)

HIST 3102. History of Rome. (L or A) (3) From the beginning of civilization in Italy to the 5th Century A.D. (*Alternate years*)

HIST 3105. Early Middle Ages, 300 A.D.-1100 A.D. (L or A) (3) Europe from the decline of the Roman Empire to the 12th century; spread of Christianity, the Frankish Monarchy, and the Crusades. (*Alternate years*)

HIST 3106. The High and Later Middle Ages, 1000 A.D.-1450 A.D. (L or A) (3) The revival of towns, growth of centralized monarchies, and the Black Death and its consequences. (*Yearly*)

HIST 3107. Renaissance Europe. (A) (X) (3) Social, economic and political consequences of the Cultural awakening in Italy. (*Yearly*)

HIST 3108. Reformation Europe 1400-1650. (3) The Protestant Reformation and its impact on Western Europe. (*Alternate years*)

HIST 3109. Renaissance and Reformation Europe. (3) (A or X) European history in the era of Renaissance and Reformation, 1400 to 1650, with special attention to art and comparative analysis. *(Fall)*

HIST 3110. The European World in the Era of the French Revolution. (3) The role of the Enlightenment, the French Revolution and Napoleon in the destruction of the Old Regime and the creation of modern political and social traditions. (*Alternate years*)

HIST 3115. Nineteenth Century Europe, 1814-1914. (3) Political developments in European history from the Congress of Vienna: liberalism, nationalism, imperialism and the diplomacy leading to World War I. (*Alternate years*)

HIST 3116. Twentieth Century Europe, 1914 to the Present. (3) Causes and results of World War I, rise of new governments, collapse of collective security, World War II and the postwar period. (*Alternate years*)

HIST 3130. History of Socialism and Communism. (3) Socialism before the establishment of the First International, followed by analysis of the socialist and communist movements until the present. (*Alternate years*)

HIST 3134. European Intellectual History Since 1789. (3) Leading thinkers in the development of philosophic, scientific and political thought. (*Alternate years*)

HIST 3141. World War I. (3) World War I from the outbreak of hostilities to the peace settlement. Impact on the combatant nations and subsequent development of the World. (*Yearly*)

HIST 3147. The Third Reich. (3) The origins of Nazism, the seizure of power, Hitler's domestic and foreign policy, and the collapse in World War II. (*Alternate years)*

HIST 3150. Shakespeare's England. (3) (W, L) England during the century surrounding the life of William Shakespeare using literature from the period as a window

through which to explore issues of political, religious, economic, and social change. *(Yearly)*

HIST 3160. History of Modern China. (3) China from 1600 to the present covering the founding of the last imperial dynasty, the arrival of the West, and China's struggle for unity in the twentieth century. (*Alternate years*)

HIST 3162. Revolutionary Movements in Modern China. (3) Examination of popular uprisings in nineteenth-century China and their relationship to China's twentieth-century revolutionary experience. (*Alternate years*)

HIST 3165. History of Modern Japan. (3) Japan from about 1600 to the present covering Japan's intellectual, social and economic transformation from an agricultural society to an industrial power. (*Alternate years*)

HIST 3166. Social and Economic History of Modern Japan. (3) Social, political and economic foundations of Japan's present-day success, including the role of education, labor unions, intellectuals, women, the military, and Japanese colonialism. (*Alternate years*)

HIST 3168. Women and the Family in Modern East Asia. (3) Examination of women's contributions to China and Japan and the impact of two hundred years of radical social change of women's status with emphasis on the role of women in intellectual, labor, and revolutionary movements in the twentieth century. (*Alternate years*)

HIST 3170. Vietnam: A Century of Conflict. (3) Rise of Vietnamese nationalism under French rule and its growth into full-scale civil war in the years following World War II. Transition from French to American involvement in Vietnam and the consequences of that involvement for Southeast Asia, East-West relations, and U.S. politics. (*Alternate years)*

HIST 3176. History of Mexico. (3) A survey of Mexican history from pre-Columbian times to the present. Special emphasis will be given to the Spanish conquest, the colonial economy, the independence period, the revolution, and relations with the United States. (*Alternate years*)

HIST 3177. The Cuban Revolution. (3) An examination of the economic and political forces that led to the Cuban revolution. Significant background material from the 19th and early 20th centuries will be presented in addition to an analysis of the revolution and post-revolutionary events. (*Alternate years*)

HIST 3201. Colonial America. (3) Colonial history from the discoveries to 1763. (*Fall*)

HIST 3202. The American Revolution and Early Nation. (3) The achievement of independence and the formation of a national government, 1763-1800. (*Spring*)

HIST 3211. Civil War and Reconstruction, 1860-1877. (3) The American people in war and the postwar adjustment. Emphasis on the political, social and economic conditions of the North and South during the Civil War and Reconstruction period. (*Alternate years*)

HIST 3212. History of the South to 1865. (3) The South from colonial origins through the Civil War. Emphasis on the political and cultural developments which ultimately led the South to secession and the creation of a distinct Southern nation in the Confederacy. (*Yearly*)

HIST 3213. History of the South since 1865. (3) Southern history from Reconstruction to the present. Emphasis on race and class relations as the South copes with change. Special attention to the Civil Rights Movement, industrialization and urbanization. (*Yearly*)

HIST 3214. The Urban South. (3) Development of the Southern city from the colonial period to the present with emphasis on the agricultural base of urban life, the biracial character, and early economic dependence upon the North. (*Alternate years*)

HIST 3215. Southerners. (W) (3) Prerequisites: ENGL 1101 and 1102. A writing-intensive course that explores the distinctive characteristics of Southerners through study of biographies and autobiographies. The varied backgrounds of Southerners and selected Americans from other regions will be studied. (*Alternate years*)

HIST 3216. American Medical History. (C) (3) History of American medicine and the relationship between medical thought and changing cultural beliefs. (*Fall*)

HIST 3241. United States Social History to 1860. (C) (3) Ideas, groups and institutions that shaped early America, with emphasis upon the changes in family, religion, community and class. (*Alternate years*)

HIST 3242. United States Social History since 1860. (3) Ideas, groups and institutions that evolved from the Civil War to the present, with emphasis upon the formation of modern-day American society. (*Alternate years*)

HIST 3252. United States in the 20th Century, 1932-Present. (3) Political, economic, social and intellectual aspects of American democracy from the New Deal to the Great Society. Special emphasis on the New Deal and post-New Deal reform as well as America's role in world affairs. (*Spring*)

HIST 3256. United States Foreign Relations, 1901 to the Present. (3) American diplomatic history from the administration of Theodore Roosevelt to the present. Special emphasis on the interaction between domestic, economic, political and social changes and the formulation of American foreign policy. (*Alternate years*)

HIST 3281. American Cities. (3) U.S. urban history. The city as a physical place, as a socio-political environment and as a cultural center. Emphasis on the social developments caused by urbanization. (*Alternate years*)

HIST 3284. Crime and the Police. (3) Historical development of criminal behavior, criminal law,the criminal courts, the police and the penitentiary system. (*Alternate years*)

HIST 3288. The Frontier in United States History. (3) Influence of the frontier on the historical development of the

U.S. Emphasis on the trans-Mississippi Western United States. (*Alternate years*)

HIST 3700. Honors in History. (W) (3) Prerequisite: consent of instructor. Treatment of historical topic. May be repeated for credit as topics vary. (*Yearly*)

HIST 3799. Senior Honors Thesis. (3) Prerequisite: consent of the instructor. The preparation and presentation of an acceptable honors thesis or its equivalent. (*On demand*)

HIST 3800. Independent Projects in History. (3) Prerequisite: consent of instructor. Individual research or readings on an historical topic. May be repeated for credit with consent of the coordinator or instructor. (*On demand*)

Undergraduate/Available for Graduate Credit

Additional work required for graduate credit.

HIST 4000. Problems in American History. (W) (3) (3G) Prerequisite: HIST 2100 or permission of the department. A colloquium designed around a problem in American history, requiring reading, discussion, reports and a major paper. May be repeated for credit as topics vary. (*Fall, Spring) (Evenings*)

HIST 4001. Problems in European History. (W) (3) (3G) Prerequisites: HIST 2100 or permission of the department. A colloquium designed around a problem in European history, requiring reading, discussion, reports and a major paper. May be repeated for credit as topics vary. (*Yearly, Summer) (Evenings)*

HIST 4002. Problems in Non-Western History. (W) (3) (3G) Prerequisite: HIST 2100 or permission of the department. A colloquium designed around a problem in non-Western history, requiring reading, discussion, reports and a major paper. May be repeated for credit as topics vary. (*Yearly)*

Graduate Only

HIST 6000. Topics in History. (3G) Intensive treatment of a period or broader survey of a topic, depending on student needs and staff resources. May be repeated for credit as topics vary. *(Fall, Spring) (Evenings)*

HIST 6196. Urban Systems for School Administrators. (3G) Corequisite: POLS 6196. An interdepartmental, team-taught course which consists of a survey of the causes and consequences of urbanization in the United States with particular attention to the urban South. Urbanization is treated as a system linking historic, political, economic, and social factors, particularly since 1945. *(Summer)*

HIST 6200. History Teaching Alliance Institute. (3G) Open under special arrangement. *Pass/No Credit* grading only. *(On demand)*

HIST 6210. Early America, 1607-1820. (3G) Development of American institutions from the period of English settlement through the establishment of Republicanism under the Constitution. (*Alternate years*)

HIST 6215. Jacksonian America, 1820-1848. (3G) Examination of important economic, social and political changes including industrialization, the rise of the Democratic Party and reform movements. (*Alternate years*)

HIST 6220. The Old South. (3G) Evolution of the Old South from the 17th century to its collapse in the Civil War and Reconstruction, focusing on southern distinctiveness and the tension between democracy and slavery. (*Alternate years*)

HIST 6225. The New South. (3G) Continuity and change in the South from the late-19th century, including industrialization, politics, class and race relations, and religion. (*Alternate years*)

HIST 6230. European Social History. (3G) Examination of the views of different writers on class formation, the rise of modern institutions, gender relations and social protest including why certain schools of thought such as modernization or Marxism become popular at particular historical moments. (*Alternate years*)

HIST 6240. U.S. Political and Economic History, 1865-1939. (3G) Emergence of the modern industrial economy and the concomitant development of a large bureaucratic federal government including big business, technological innovation, the labor movement, progressive reform and regulatory policies. (*Alternate years*)

HIST 6250. Comparative Slavery and Race Relations. (3G) Slavery in the New World through its abolition including Indian and African slaves, the slave trade, the economics of slavery, and the impact of slavery on modern race relations in the Americas. (*Alternate years*)

HIST 6265. Cold War America. (3G) Domestic and foreign policy problems accompanying the post-World War II struggle between East and West, Communism and capitalism including McCarthyism, modern technology, foreign aid, Korea, Vietnam, civil rights, gender roles and natural resources. (*Alternate years*)

HIST 6601. Graduate Colloquium. (3G) A colloquium focused on a theme or period. Assigned readings, short papers and reports directed toward developing research and writing skills. May be repeated for credit. *(Fall, Spring) (Evenings)*

HIST 6693. Historiography and Methodology. (3G) A study of historians and their philosophical and methodological approaches. Required of all M.A. candidates. *(Yearly) (Evenings)*

HIST 6698. Introduction to Historical Writing. (3G) Seminar on the process of thesis writing including thesis proposals, primary source materials, rules of evidence, structure of an argument, and organization of the thesis and its chapters. May be repeated for credit. *(On demand)*

HIST 6894. Readings in History. (3G) Prerequisite: prior written consent of instructor. Coverage of historical periods or topics through individually designed reading programs; scheduled conference with a staff member. May be repeated for credit. *(Fall, Spring) (Evenings)*

HIST 6901. Directed Readings/Research. (3G) Prerequisite: prior written consent of instructor and

graduate coordinator. Graduate students will meet individually or in small groups with the instructor and will be assigned readings and/or research on a theme that relates to the lectures of an undergraduate class. Attendance at the lectures is a course requirement. May be repeated for credit. (*Fall, Spring, Summer*)

HIST 6997. Directed Research. (3G) Prerequisite: prior written consent of instructor. Investigation of a historical problem culminating in a research paper. May be repeated for credit. *(On demand)*

HIST 6999. Thesis. (3G or 6G) May be repeated by permission, if taken for three hours credit. Six hours of Thesis may be taken during a single semester. Appropriate research and written exposition of that research is required. *(On demand)*

HIST 7894. Readings in History. (3G or 6G) Prerequisite: doctoral student with prior written consent of the instructor. Coverage of historical periods or topics through individually designed reading programs; scheduled conferences with a designated member of the graduate faculty. May be repeated for credit. *(Fall, Spring, Summer)*

HEALTH EDUCATION (HLED)

Undergraduate

HLED 2101. Healthy Lifestyles. (3) A health survey course with emphasis on health behavior, decision making and knowledge. (*Fall, Spring, Summer*)

HLED 2150. Introduction to Health Fitness. (3) Prerequisites: PHIL 2101 and HLED 2101. Introduction to the study of health fitness relative to philosophies, practices, work settings, trends, knowledge bases, skills and licensures. *(Fall)*

HLED 2160. Nutrition and Health Fitness. (3) Prerequisites: CHEM 1204 and 1204L and HLED 2101. Introduction to principles and concepts of nutrition and how dietary practices affect health and disease. (Fall)

HLED 3110. Health Risk Reduction for Practitioners. (3) Prerequisites: CSCI 1101, STAT 1222 and HLED 2101. The art and science of planning, implementing and evaluating health risk reduction strategies, methods and programs. (*Fall*)

HLED 3130. Lifetime Weight Management. (3) Prerequisites or corequisites; HLED 2160, PSYC 2112. Examines factors in obesity and weight control, emphasizing techniques in behavior modification and lifestyle change for effective weight management. *(Spring)*

HLED 3140. Behavior Change Programming in Health Fitness. (3) Prerequisites: HLED 2101, 2150 and PSYC 1101. Principles of behavior change programming and health consulting through an understanding of program planning and evaluation, the origins of various human behavior, contributing factors, issues in adherence and compliance and modern behavior change theories. *(Spring)*

HLED 3152. Health and Safety Issues in Middle and Secondary Schools. (2) Prerequisites: Junior or senior status, EDUC 2100 and SPED 2100. Provides the pre-service teacher with the curricular content of health and safety in grades 6-12. Focuses on knowledge and behaviors conducive to health and safety. *(Fall, Spring)*

HLED 3160. Practitioner Seminar. (W) (3) Prerequisites: COMM 1101, COMM 2105 and must be taken during the term prior to internship (HLED 3490). Emphasis is on state of the art health enhancement practices. *(Fall, Spring)*

HLED 3228. Teaching Health and Safety in the Elementary School. (2) Prerequisites: Junior or senior status, EDUC 2100, 3120, and SPED 2100. Orientation of the elementary specialist to content and curriculum appropriate for teaching health education in grades K-6. *(Fall, Spring)*

HLED 3490. Health Fitness Senior Internship. (6-15) Prerequisites: Completion of all other courses for the major. Application of acquired knowledge and skills in practitioner settings. Each 3 hours of credit requires a minimum of 8 contact hours per week at the internship site. *(Fall, Spring, Summer)*

HLED 4136. Health Product and Service Consumerism. (3) (3G) Teaching methodology, knowledge and skills for affecting appropriate health behaviors through emphasis on the individual consumer at the health marketplace. *(On demand)*

HLED 4299. Epidemiology. (3) (3G) Prerequisite: permission of the instructor. Traditional aspects of epidemiology, including practical disease concepts, epidemiological measures of health status, mortality and morbidity rates and ratios, descriptive statistics, research design, cohort studies, case-control studies, and prospective and retrospective analysis. *(Fall)*

Graduate and Advanced Undergraduate

HLED 5120. Mental and Emotional Well-being. (3) (3G) Examines mental and emotional health from the perspective of the health educator's role as a facilitator of mental and emotional wellness. (*2 year cycle*)

HLED 5122. Drugs and Society. (3) (3G) Teaching methodology, knowledge and skills for affecting appropriate behaviors through the study of use, misuse and abuse of natural and synthetic chemicals in today's society. *(On demand)*

HLED 5124. Safety Through the Life Span. (3) (3G) Prerequisite: consent of the department. Introduction to accident/injury prevention emphasizing personal responsibility for health care with a focus on psycho-social development and a wellness approach to safety management. (*2 year cycle*)

HLED 5126. Adolescent Sexuality and Family Life Education. (3) (3G) Designed for teachers, counselors, school nurses, administrators and others responsible for

family life education programs in school, with focus on adolescent sexuality issues. (*2 year cycle*) *(Summer)*

HLED 5128. Environmental Health: A Global Perspective. (3) (3G) Teaching methodology, knowledge and skills for affecting appropriate health behaviors through study of the causes and effects of contemporary environmental problems. (*2 year cycle*)

HLED 5130. Applied Nutrition for Today's Consumer. (3) (3G) Principles of nutrition, dietary guidelines, dietary relationships to diseases and health, special populations, computerized dietary analysis. (*2 year cycle*)

HLED 5134. Assessment and Development of Physical Fitness. (3) (3G) Prerequisite: consent of the instructor. Study of responses and adaptations to exercise, assessment techniques, exercise prescription, leadership and programming. (*2 year cycle*)

Graduate Only
HLED 6120. Philosophy and Practice in Health Promotion. (3G) Philosophies, modalities and arenas of practice in health promotion; role delineation, professional development, advocacy and ethics. *(Alternate years)*

HLED 6141. Health Promotion Administration. (3G) Management and leadership, strategic planning, grant proposal writing, staffing, staff development and program coordination in health promotion settings. *(Alternate years)*

HLED 6143. Behavior Change in Health Promotion. (3G) Assessment and modification of health behaviors. *(2 year cycle)*

HLED 6145. Health Promotion Planning and Evaluation. (3G) Designing, implementing and evaluating health promotion/education programs within work site, school and community settings. *(2 year cycle)*

HLED 6151. Coordinating the School Health Education Program. (3G) Examines the school health education program from the perspective of the school health education coordinator. *(2 year cycle)*

HLED 6153. Worksite Health Promotion. (3G) Prerequisite: consent of the instructor. An exploration of the practices of promoting health in various settings for a variety of consumers. *(2 year cycle)*

HLED 6155. Health Risk Reduction and Disease Prevention. (3G) Personal/professional management of risk factors and lifestyle intervention processes for leading causes of mortality and morbidity. (*On demand)*

HLED 6160. Community Health. (3G) The nature and delineation of communities as social systems; principles and practices relevant to community health. *(2 year cycle)*

HLED 6189. Community Epidemiology. (3G) Principles and methods of epidemiology including definitions and models of health, illness and disease; modes of transmission of clinically important infectious agents; risk factors and chronic diseases; and insights into existing studies and paradigms of health promotion and disease preventions. (Same as HADM 6103) *(Spring)*

HLED 6471. Seminar and Internship in Health Education. (1-6G) Prerequisites: Completion of 12 or more graduate credit hours in health education and permission of the health education program coordinator. Supervised practice in health education. May be repeated for a different seminar and internship. Offered only on a *Pass/No Credit* basis. (*Fall, Spring, Summer*)

HLED 6899. Problems and Topics in Health. (1-6G) Topics and special problems related to issues, practices or sufficient trends in health promotion. Institutes, workshops, seminars and independent studies. *(Fall, Spring, Summer)*

HLED 7999. Graduate Residence. (0G) Independent research. Required of all master's degree students who are working on a thesis but not enrolled in other graduate courses. (*Fall, Spring*)

UNIVERSITY HONORS (HONR)
All courses require permission of the Honors Program.

Undergraduate
HONR 1701. War, Peace, Justice and Human Survival. (L) (3) Relationships between individual and local, state and global values examined within the context of war, peace and justice. (*Fall, Spring*)

HONR 1702. Economic Welfare and International Communities. (WX) (3) Study of the impact of economic institutions on international communities. Focus on development theories, multinational institutions, international debt and Third World response, international poverty and income distribution, and the economic impact on international communities of military spending. (*Fall, Spring)*

HONR 2701. Enrichment Seminar. (A) (2) Students attend a variety of events from the visual and performing arts as well as special lectures. Students are introduced to events, both contemporary and traditional, to which they would not otherwise be exposed. Short written reports and class discussion required. Offered on a *Pass/No Credit* basis. (*Fall, Spring*)

HONR 2750. Community Service Laboratory. (1) Laboratory experience complements the University Honors course sequence on Issues for Human Survival in the 21st Century. Investigation and demonstration of how individuals can make a difference in the human condition. Through weekly seminars, relationships between the volunteers and community agencies within the context of problem-solving strategies and social/political justice are examined. Emphasis is upon problems emergent with the interaction between volunteers and low income, less fortunate, under-educated populations involved. Impact of volunteerism upon human rights will be explored. Class discussion required. Offered on a *Pass/No Credit* basis. (*Fall, Spring, Summer- On demand)*

HONR 3700. University Honors Topics. (3) Prerequisite: consent of University Honors Program Director. A small discussion oriented class team-taught by faculty members from different disciplines on interdisciplinary topics. (*On demand*)

HONR 3701. Science, Technology and Human Values. (V) (3) Prerequisites: HONR 1701 and 1702. Study of historical and contemporary issues between science and technology, on the one hand, and ethical, religious and social concerns on the other hand. *(Fall)*

HONR 3702. Human Rights and Social Justice. (WC) (3) Prerequisites: HONR 1701, 1702. Multicultural examination of the foundations of laws which govern human communities and the means by which their authority is legitimated. Consideration of justice and human rights concepts from the perspectives of a variety of intellectual traditions. *(Spring)*

HONR 3790. University Honors Thesis. (3) Prerequisites: six hours of honors course work and consent of thesis director and University Honors Committee. Honors project directed by faculty member and seminar on thesis project options, styles expectations and problems. May be repeated for credit. One seminar hour per week and independent research. *(Fall, Spring, Summer)*)

INDUSTRIAL ENGINEERING TECHNOLOGY (INET)
See Engineering Technology

MANAGEMENT INFORMATION SYSTEMS (INFO)

Undergraduate

INFO 2130. Introduction to Business Computing. (3) Prerequisites: MATH 1110 or equivalent. Introduction of computer methods to solve business problems. Emphasis on understanding fundamental hardware and software concepts, selecting and using appropriate hardware and software needed for making various business decisions, and developing practical methods for using the computer to solve quantitative business problems. (May not be taken for upper-level credit in business, but may be taken for general University credit.) *(Fall, Spring, Summer) (Evenings)*

INFO 3000. Topics in Management Information Systems. (3) Prerequisite: INFO 3130. Topics from the area of Management Information Systems. May be repeated for credit. *(On demand)*

INFO 3130. Management Information Systems. (3) Prerequisites: ACCT 2121, 2122, ECON 1201, 2102, INFO 2130; junior standing. Impact of information systems on management decision-making activities. Principles of the structure and analysis of information flows within an organization. Emphasis on database accumulation and generation, capabilities of information processing, system function (e.g. file creation, report generation, etc.) and evaluation and modification of information systems. *(Fall, Spring, Summer) (Evenings)*

INFO 3200. Foundations in Business Computing. (3) Introduction to computer systems in business with emphasis on the capabilities of computer systems (hardware & software) and skills needed to effectively use computerized decision tools for typical business problems. (Cannot be taken for credit toward any undergraduate degree within the Belk college of Business Administration.) (Formerly INFO 3131.) *(Fall, Spring)*

INFO 3231. Business Applications Development. (3) Prerequisites: Junior standing or permission of the instructor. A study in the development of business applications software. Course emphasizes graphical user interface development using object-oriented, event-driven programming methods and techniques with a high level development tool such as Visual Basic. *(Yearly)*

INFO 3231. Business Application Development. (3) Prerequisites: Junior standing or permission of the instructor. Development of business application software, including graphical user interface development using object-based, event-driven programming methods and techniques with a high level development tool such as Visual Basic. *(On Demand)*

INFO 3233. Business Database Systems. (3) Prerequisites: INFO 3130 or permission of the depart-ment. A study of the effective management and utilization of organizational data resources in order to design and implement database management systems (DBMS) for business applications. Exploration of basic concepts of database systems and use of the computer to build and manipulate corporate databases. *(Fall, Spring)*

INFO 3234. Business Information Systems Development. (3) Prerequisites: INFO 3130, and MGMT 3140 or permission of the department. Examination of the systems development process from the perspective of the systems analyst to provide an understanding of concepts, processes and techniques as they are applied to the systems development life cycle. Emphasis on the use of structured techniques to manage the complexities involved in the analysis phase of systems development. *(Fall, Spring)*

INFO 3235. Advanced Business Information Systems Development. (3) Prerequisites: INFO 3233, 3234; CSCI 2112. Development of business information systems. Emphasis on the development of computer applications as products of the systems development life cycle including the design and implementation phases of systems development, as accomplished through a major class project. *(Fall, Spring)*

INFO 3236. Business Decision Support Systems. (3) Prerequisites: INFO 3130, FINN 3120, MGMT 3140 or permission of the department. A study of the application of the computer to middle and upper level management processes to provide computer skills needed to implement such applications. Reading, discussion, and hands-on computer projects. *(Alternate years)*

INFO 3238. Current Issues in The Management of Information Systems. (3) Prerequisites: INFO 3130, MGMT 3140 or permission of the department. Information systems and the management of information in an organization to provide exposure to the decision challenges presented to the corporate manager by the rapid development of information technology and to suggest useful constructs for dealing with them. An integrated, interactive approach to decision making. *(Alternate years)*

INFO 3239. Business Data Communications. (3) Prerequisites: INFO 3130, MGMT 3140. A study of the current and potential impact of computer data communications technologies on business operations and productivity. Topics include identifying the need for and

designing, planning and implementing of system solutions in such areas as text preparation and dissemination, document storage and retrieval, data communication technologies, telecommuting and teleconferencing, data communication networks, messaging and scheduling. *(Fall, Spring)*

INFO 3500. Cooperative Education Experience. (0) Enrollment in this course is required for the department's cooperative education students during any semester they are working in a co-op position. This course is restricted to majors in the Department of Management Information Systems and Operations Management. Course evaluation is Satisfactory/Unsatisfactory. *(Spring, Summer, Fall)*

INFO 3800. Directed Study. (1-6) Prerequisites: consent of the department and junior standing. Enrollment granted only by permission of the faculty with whom the work will be performed. The student's work assignments will be designed by the student and faculty member who will oversee the project of study. The credit hours will be determined prior to enrollment and will be based on the particular project undertaken. *(On demand)*

JAPANESE (JAPN)

Undergraduate
JAPN 1201. Elementary Japanese I. (4) Acquisition of communicative competence in speaking, listening comprehension, reading, and writing at a beginning level with attention to cultural awareness. *(Fall, Spring, Summer)*

JAPN 1202. Elementary Japanese II. (4) Prerequisite: JAPN 1201 or permission of the department. Continuation of JAPN 1201. *(Spring, Summer, Fall)*

JAPN 2201. Intermediate Japanese I. (4) Prerequisite: JAPN 1202 or permission of the department. Acquisition of communicative competence in speaking, listening comprehension, reading, and writing at an intermediate level with attention to cultural awareness. *(Fall)*

JAPN 2202. Intermediate Japanese II. (4) Prerequisite: 2201 or permission of the department. Continuation of JAPN 2201. *(Spring)*

JAPN 3201. Advanced Japanese Grammar, Composition and Conversation I. (4) Prerequisites: JAPN 2202 or permission of the department. Review of Japanese grammar and guided conversation on prepared topics. Emphasis on spoken Japanese. *(Fall)*

JAPN 3202. Advanced Japanese Grammar, Composition and Conversation II. (4) Prerequisites: JAPN 3201 or permissionn of the department. Review of Japanese grammar and guided compositions on prepared topics. Emphasis on vocabulary, idiomatic expressions, and stylistics. *(Spring)*

JAPN 3209. Japanese Civilization and Culture. (3) Prerequisites: JAPN 2202 or permission of the department. A study of the life and thought of Japanese-speaking people both past and present. *(On demand)*

JAPN 3800. Directed Individual Study (1-3) Prerequisite: permission of the department. Individual work on a selected area of study with the instructor, generally arranged during the preceding semester. May be repeated for credit. *(On demand)*

JOURNALISM (JOUR)

Undergraduate
JOUR 2160. Introduction to Journalism. (W) (3) Introduction to the basics of news reporting, interviewing, and feature writing, with emphasis on development of news writing skills, field experience, and media ethics. *(Fall, Spring)*

JOUR 3160. News Writing. (3) Prerequisite: JOUR 2160 or permission of instructor. Journalistic news writing with emphasis on reporting for newspapers. Students write news stories about events occurring during the semester. Examination of historical, legal and ethical aspects of the American press. *(Fall)*

JOUR 3161. News Editing. (3) Prerequisite: JOUR 2160 or permission of instructor. Basic studies in selection, preparation and presentation of news, with primary emphasis on newspapers. Examination of the effects of competition in multimedia news markets. Emphasis on issues of ethics, fairness and accuracy in news coverage, including a review of legal guidelines affecting news presentation. *(Spring)*

JOUR 3162. Feature Writing. (3) Prerequisite: JOUR 2160 or equivalent. Researching, writing, and editing a variety of journalistic features, from human interest stories to investigative reporting. *(Spring) (Alternate years)*

LATIN (LATN)

Undergraduate
LATN 1201. Elementary Latin I. (4) Beginning survey of elementary Latin grammar through selected readings. *(Fall)*

LATN 1202. Elementary Latin II. (4) Prerequisites: LATN 1201 or equivalent. Completion of the survey of elementary Latin grammar; connected readings in elementary to intermediate Latin Prose. *(Spring)*

LATN 2201. Latin Prose. (3) Prerequisites: LATN 1202 or equivalent. Extended selected readings in Latin prose of intermediate difficulty: Caesar, Nepos, or Seneca. *(On demand)*

LATN 2202. Directed Individual Reading. (1-3) Prerequisite: permission of instructor. Individual work on an author or genre to be arranged with the instructor. *(On demand)*

LIBERAL STUDIES (LBST)

Graduate
LBST 6000. Topics in Liberal Studies. (3G) Selected topics approached from interdisciplinary perspectives in the liberal arts. May be repeated for credit as topics change. Examples include interrelated courses forming program emphasis on Language and Culture and on Religious Ideas in Physical Forms. *(Fall, Spring)*

LBST 6101. The Liberal Arts Tradition. (3G) The concept of a liberal education and its relationship to human

understanding as reflected in representative historical traditions, literature, art, and intellectual works. Examination of selected classics of the Western tradition and critiques through the use of works from other traditions and perspectives. (*Fall, Spring*)

LBST 6102. Ideas Across the Disciplines. (3G) Enduring ideas and their impact on history, society and culture. Each semester a single idea is examined through a variety of writings spanning the liberal arts disciplines. Examples include the idea of human nature, the idea of the democracy and the idea of citizen. *(Fall, Spring)*

LBST 6600. Liberal Studies Seminar. (3G) An integration of the course work previously taken by each of the seminar members and the completion of a final essay or project. (*Yearly*)

LIBERAL ENGINEERING STUDIES (LEGR)

The following courses are intended primarily for non-engineering students who wish to explore various aspects of societal-technological interactions. Engineering students may enroll but may not use these courses to fulfill requirements for any engineering degree.

Undergraduate

LEGR 1111. Technological Bases of Society I. (3) Concepts underlying the systems which relate directly to the life of the individual in relation to the field of engineering. Emphasis on scientific ideas relevant to the student--ones that he or she should understand to participate in the decisions of an age of rapidly changing technology. Specific topics include decision making, optimization, modeling and systems. (May be taken with or without LEGR 1151.) (*On demand*)

LEGR 1112. Technological Bases of Society II. (3) Prerequisite: LEGR 1111. A continuation of LEGR 1111. Introduction to technological concepts which are applicable to the solution of problems of a social and economic, as well as a technical, nature--problems that are rapidly becoming the frame of reference for contemporary society. Specific topics include patterns of change, feedback, stability, and machines and systems. (May be taken with or without LEGR 1152.) (*On demand*)

LEGR 1151. Technological Bases of Society- Laboratory I. (1) Corequisite: LEGR 1111. A laboratory course designed to illustrate the concepts presented in LEGR 1111. Simulation of real life situations using simple laboratory equipment. Two laboratory hours per week. (*On demand*)

LEGR 1152. Technological Bases of Society- Laboratory II. (1) Prerequisite: LEGR 1151. Corequisite: LEGR 1112. A laboratory course designed to illustrate the concepts presented in LEGR 1112. A continuation of LEGR 1151. Two laboratory hours per week. (*On demand)*

LEGR 3090. Special Topics in Liberal Engineering. (1-4) Prerequisite: consent of the instructor. Supervised study or travel opportunities that are beyond the scope of existing courses. May be repeated for credit. (*On demand*)

LEGR 3111. Technology in Historical Perspective. (3) Prerequisite: junior standing. Selected historical cases in science, applied science and technology are reviewed to show the impacts that technological advances have had on our world. Emphasis is placed on the technologies and their effect on our physical environment rather than on the resulting change in our viewpoint toward society, economics or politics. (*On demand*)

LEGR 3114. Problems in Environmental Control. (W) (3) Prerequisite: junior standing. Study of a range of environmental problems of interest to the class. The tracing of problem cases to their technological origins; the identification of available, feasible, technological origins; the identification of available, feasible, technological solutions to the specific problems treated. On-site inspection of industrial sources of pollution will be made in a series of field trips. (*On demand*)

LEGR 3116. Energy, Power and Conservation. (3) Prerequisite: junior standing. A survey of historic, current and future power sources and devices, including waterwheels and windmills, steam engines and turbines, internal combustion and jet engines, fission and fusion reactors and geothermal, tidal and solar power. Fuel resource reserves, costs, benefits and conservation will be studied. (*On demand*)

MATHEMATICS EDUCATION (MAED)

MAED courses offered by the Department of Mathematics are intended primarily for students seeking teacher licensure, license renewal, or license upgrading. These courses may not be used to satisfy the requirements for a major or minor in mathematics. They may be accepted as non-math electives for B.A. and B.S. degrees in mathematics and for the M.A. in mathematics education. See also MATH 2101, 2102, and 2103.

Undergraduate

MAED 3000. Topics in Mathematics Education, Elementary (1-6) Prerequisite: consent of the department. Special topics in mathematics education for grades K-6. May be repeated for credit as topics vary. (*On demand*)

MAED 3040. Topics in Mathematics Education, Middle Grades. (1-6) Prerequisite: consent of the department. Special topics in mathematics education for middle grades. May be repeated for credit as topics vary. (*On demand*)

MAED 3070. Topics in Mathematics Education, Secondary. (1-6) Prerequisite: consent of the department. Special topics in mathematics education at the secondary level. May be repeated for credit as topics vary. (*On demand*)

MAED 3103. Using Technology to Teach Secondary School Mathematics. (3) Prerequisite: consent of the department. Technology is a tool for exploring mathematical ideas and representing mathematical concepts, including lab assignments related to using technology throughout the secondary school mathematics curriculum. *(Spring)*

MAED 3105. Geometry in the Secondary School Mathematics Curriculum. (3) Prerequisite: consent of the department. Study of geometry from synthetic, transformational, and algebraic perspectives including activities and software to enhance the conjecture/theorem/proof process. *(Fall)*

MAED 3141. Algebra and Problem Solving for Middle School Teachers. (3) Prerequisites: MATH 1103 and 2102. An overview of algebra from middle grades through college with emphasis on mastering algebraic concepts, skills, and teaching techniques. Topics include: functions, analytic geometry, vectors and matrices, and field properties of the real numbers. Observations, teaching experiences, and activities in junior high school and high school algebra. *(Fall)*

MAED 3232. Teaching Mathematics to Middle School Learners. (3) Prerequisites: Admission to Teacher Education and Senior Standing. Corequisite: SPED 3290. Preparation to teach mathematics at the middle school level with emphasis on problem solving, mathematical connections, manipulatives, cultural diversity, and assessment. *(15 hours additional field experience required) (Fall)*

MAED 3252. Teaching Mathematics to Secondary School Learners. (3) Prerequisite: admission to teacher education program or consent of the department. Secondary school mathematics and its relation to the curriculum K-12. Teaching strategies and activities in secondary school mathematics with emphasis on problem solving, mathematical connections, communication, disclosure, and assessment, including school-based field experiences. *(Fall) (Evenings)*

Graduate and Advanced Undergraduate
MAED 5000. Topics in Mathematics Education, Early Childhood. (1-6) (1-6G) Prerequisite: consent of department. *(On demand)*

MAED 5040. Topics in Mathematics Education, Intermediate. (1-6) (1-6G) Prerequisite: consent of department. *(On demand)*

MAED 5070. Topics in Mathematics Education, Secondary. (1-6) (1-6G) Prerequisite: consent of department. *(On demand)*

MAED 5101. Arithmetic in the School. (3) (3G) Prerequisite: MATH 1100 or equivalent. A study of the number systems with emphasis placed upon the basic concepts and meanings, properties of addition, multiplication, inverses, systems of numeration and number line appropriate for each grade. (Does not count toward a major in mathematics. Open only to transfer students who have completed six semester hours of mathematics at another university.) *(On demand)*

MAED 5104. Microcomputing for Teachers. (3) (3G) Prerequisites: working knowledge of college algebra and trigonometry, and consent of department. Introduction to basic computer concepts, to microcomputer systems, to the design and development of programs to assist instruction in mathematics and computer sciences. A programming language such as BASIC or LOGO will be used. Each student will integrate skills learned by selecting, designing and developing a specific project. (No prior experience with computer programming required.) *(Spring) (Evenings)*

MAED 5105. Geometry for Teachers. (3) (3G) Prerequisite: MATH 2102 or MAED 5101 or consent of department. A study of the foundations of Euclidean geometry and a brief treatment of non-Euclidean geometry. Emphasis on learning activities and teaching techniques for teachers of mathematics K-12. *(Spring) (Evenings)*

MAED 5141. Mathematics for the Intermediate School Teacher. (3) (3G) Prerequisite: MATH 2102 or consent of department. A study of the algebraic properties of the real numbers; functions, equations, inequalities and their graphs, activities and applications related to upper elementary and intermediate grades. *(Fall) (Evenings)*

MATHEMATICS (MATH)

All MATH/STAT/OPRS courses offered by the Department of Mathematics are approved to satisfy requirements for the Problem Solving Goal of UNC Charlotte Education.

Undergraduate
MATH 1100. College Algebra and Probability. (3) Prerequisite: appropriate score on the Mathematics Placement Test or placement by the department. The basic mathematics course for undergraduates not majoring in mathematics, engineering, or the physical sciences. Fundamental concepts of algebra and probability. (Credit may not be given for both MATH 1100 and 1103; students who received credit for MATH 1101 between Fall 1987 and Fall 1989 may not take 1100 for credit; students who already have credit for MATH 1120 or 1241 with a grade of *C* or better may not take 1100 for credit.) *(Fall, Spring, Summer) (Evenings)*

MATH 1102. Introduction to Mathematical Thinking. (3) Prerequisite: appropriate score on the Mathematics Placement Test or placement by the department. An introduction to mathematical ideas designed primarily for non-science students. Topics are drawn from various branches of mathematics which may include algebra, geometry, number theory, probability, statistics and graph theory. Computers may be used. *(Fall)*

MATH 1103. Precalculus Mathematics for Science and Engineering. (3) Prerequisite: appropriate score on the Mathematics Placement Test or placement by the department. Intended for students who plan to take MATH 1241. Functions and graphs, linear and quadratic functions, polynomial and rational functions, exponential and logarithmic functions, trigonometric identities. (Credit may not be given for both MATH 1100 and 1103; students who received credit for MATH 1100 between Fall 1987 and Fall 1989 may not take MATH 1103 for credit; students who already have credit for MATH 1120 or 1241 with a grade of *C* or better may not take MATH 1103 for credit.) *(Fall, Spring, Summer) (Evenings)*

MATH 1105. Finite Mathematics. (3) Prerequisite: appropriate score on the Mathematics Placement Test or placement by the department. Review of high school algebra, elementary matrix algebra, systems of linear equations and inequalities, elementary linear programming; probability. *(On demand)*

MATH 1120. Calculus. (3) Prerequisite: appropriate score on the Mathematics Placement Test; MATH 1100 or 1103; or placement by the department. Intended for students majoring in fields other than engineering, mathematics or science. Elements of differential and integral calculus for polynomial, rational, exponential, logarithmic and

trigonometric functions, with applications to business and the social and life sciences. (May not be taken for credit if credit has been received for MATH 1121 or 1241.) *(Fall, Spring, Summer) (Evenings)*

MATH 1121. Calculus (ET). (3) Prerequisite: appropriate score on the Mathematics Placement Test; MATH 1100 or 1103; or placement by the department. Intended for students majoring in engineering technology. Elements of differential and integral calculus for polynomial, rational, exponential, logarathmic and trigonometric functions, with applications to engineering. May not be taken for credit if credit has been received for MATH 1120 or 1241. *(Fall, Spring, Summer) (Evenings)*

MATH 1165. Introduction to Discrete Structures. (3) Prerequisite: CSCI 1100 or 1201 and its lab. Propositions and truth tables, sets, permutations and combinations, relations and functions, lattices, and trees. Credit will not be given for both MATH 1165 and 2165. *(Fall, Spring, Summer) (Evenings)*

MATH 1241. Calculus I. (3) Prerequisite: appropriate score on the Mathematics Placement Test; MATH 1103 with a grade of C or better, or placement by the department. Designed for students majoring in mathematics, science, or engineering. Elementary functions, derivatives and their applications, introduction to definite integrals. (May not be taken for credit if credit has been received for MATH 1141.) *(Fall, Spring, Summer) (Evenings)*

MATH 1242. Calculus II. (3) Prerequisite: MATH 1141 or 1241 with a grade of C or better. Methods for evaluating definite integrals, applications of integration, improper integrals, Taylor series, introduction to differential equations. (May not be taken for credit if credit has been received for MATH 1142.) *(Fall, Spring, Summer) (Evenings)*

MATH 2050. Topics in Mathematics. (2-3) Prerequisite: consent of the department. Topics in mathematics elected to supplement regular offerings at the 2000 level. (May or may not count for a Math core course for the CSCI major.) May be repeated for additional credit with the approval of the department. *(On demand)*

MATH 2101. Fundamental Concepts in Mathematics I. (3 Prerequisite: consent of the department. An intuitive development of the real number system with emphasis on the principles of teaching and learning elementary mathematics; sets and set operations; systems of numeration; arithmetic operations. Laboratory activities and practical teaching experience in an elementary classroom. May not be used to satisfy requirement for a major or minor in Mathematics. *(Fall, Spring) (Evenings)*

MATH 2102. Fundamental Concepts in Mathematics II. (3 Prerequisite: MATH 2101 with a grade of *C* or better. Mathematical systems; the study of metric and non-metric geometry; relations, functions and their graphs. Activities and applications related to elementary school mathematics goals. Practical teaching experience in an elementary classroom. May not be used to satisfy requirement for a major or minor in Mathematics. *(Fall, Spring) (Evenings)*

MATH 2103. Problem Solving in Mathematics Using Computers and Calculators in the Classroom. (3) Prerequisite: MATH 2101 with a grade of *C* or better. Calculators in the mathematics curriculum; microcomputer hardware and courseware in mathematics; LOGO; probability; data collection, analysis, and interpretation. May not be used to satisfy requirement for a major or minor in Mathematics. *(Fall, Spring, Summer) (Evenings)*

MATH 2164. Matrices and Linear Algebra. (3) Prerequisite: MATH 1120 or 1241 with a grade of *C* or better or consent of the department. Matrix algebra, systems of linear equations, vector spaces, linear transformations, determinants, inner products, eigenvalues. *(Fall, Spring, Summer) (Evenings)*

MATH 2171. Differential Equations. (3) Prerequisite: MATH 1242 with a grade of *C* or better. An introduction to ordinary differential equations including first order equations, general theory of linear equations, series solutions, special solutions, special equations such as Bessel's equation, and applications to physical and geometric problems. *(Fall, Spring, Summer) (Evenings)*

MATH 2241. Calculus III. (3) Prerequisite: MATH 1142 or 1242 with a grade of C or better. Functions of two or more variables, vectors in two and three dimensions, partial derivatives, optimization, double and triple integrals and their applications. (May not be taken for credit if credit has been received for MATH 2141.) *(Fall, Spring, Summer) (Evenings)*

MATH 2242. Calculus IV. (3) Prerequisite: MATH 2141 or 2241 with a grade of C or better. Parametric curves and surfaces, vector fields, line and surface integrals; Green's theorem, Divergence theorem, Stoke's theorem and applications. Infinite series, power series. *(Fall, Spring, Summer) (Evenings)*

MATH 3050. Selected Topics in Mathematics. (2-3) Prerequisite: consent of the department. Topics selected to supplement regular offerings at the 3000 level in mathematics or statistics. May be repeated for credit with the approval of the department. *(On demand)*

MATH 3116. Graph Theory. (3) Prerequisite: MATH 2164 or 2165 or consent of the department. Graphs as mathematical models. Planarity, colorability, connectivity, trees. Applications and algorithms for networks, matching problems and areas of computer science. *(Fall) (Alternate years)*

MATH 3122. Probability and Statistics I. (3) Prerequisite: MATH 2241 with a grade of *C* or better. Sample spaces, random variables, moment generating functions, some standard distributions, multivariate distributions, laws of large numbers, limit theorems. *(Fall) (Evenings)*

MATH 3123. Probability and Statistics II. (3) Prerequisite: MATH/STAT 3122. Estimation, bias, consistency, efficiency, maximum likelihood estimates, sufficient statistics, testing, the power function, chi-square

test, Kolmogorov-Smirnov test. Credit for mathematics major not given for both MATH 3125 and MATH/STAT 3123. *(Spring) (Evenings)*

MATH 3125. Statistical Techniques. (3) Prerequisite: consent of the department. Probability models, random variables, large sample statistics, inferential statistics, analysis of variance and experimental design. Credit for mathematics major not given for both MATH 3125 and MATH/STAT 3123. *(Spring) (Evenings)*

MATH 3141. Advanced Calculus of One Variable. (3) Prerequisites: MATH 2241 and 2164 with grades of *C* or better. Topology of the real line; continuity, uniform continuity, differentiability, integration, sequences and series of functions. *(Fall) (Evenings)*

MATH 3142. Advanced Calculus of Several Variables. (3) Prerequisite: MATH 3141. Continuity and differentiability of functions of several variables, inverse and implicit function theorems, integration, Fubini's theorem, change of variables, the classical integral theorems of Gauss, Green and Stokes and their generalizations. *(Spring) (Evenings)*

MATH 3146. Introduction to Complex Analysis. (3) Prerequisite: MATH 2241 with a grade of *C* or better. Analytic functions, complex integration, calculus of residues, conformal mapping. *(Spring) (Alternate years)*

MATH 3163. Introduction to Modern Algebra. (W) (3) Prerequisite: MATH 1241 with a grade of *C* or better or consent of the department. Examples and elementary properties of basic algebraic structures, especially groups. The course emphasizes the writing of proofs of elementary theorems. *(Fall, Spring) (Evenings)*

MATH 3166. Combinatorics. (3) Prerequisites: MATH 2164. Combinatorial modeling, generating functions, recurrence relations, inclusion-exclusion principle and problems from recreational mathematics. *(Spring) (Alternate years)*

MATH 3171. Applied Mathematics. (3) Prerequisites: MATH 2241 and 2171 with grades of *C* or better. Separation of variables techniques for the classical partial differential equations of mathematical physics; Fourier series; Sturm-Liouville theory. *(Fall) (Evenings)*

MATH 3176. Numerical Analysis. (3) Prerequisites: CSCI 1100 or 1201 and its lab, MATH 2241 and 2171. Numerical solution of initial value and boundary value problems in ordinary differential equations, direct and iterative methods of solving systems of equations. Selected problems will be programmed for computer solution. *(Spring) (Alternate years)*

MATH 3181. Fundamental Concepts of Geometry. (3) Prerequisite: MATH 2164. Foundations of geometry, transformations, comparison of Euclidean and non-Euclidean geometries. *(Fall, Spring) (Evenings)*

MATH 3551. Mathematics Cooperative Education Experience. (0) Prerequisites: Sophomore standing, a 3.0 GPA in MATH/STAT/OPRS courses and consent of the Department of Mathematics. The student will be employed in a manner that affords him/her the opportunity of using and enhancing mathematical knowledge and skills through practical experience. After completing MATH 3551, the student must take MATH 3652. MATH 3551 may be repeated with consent of the department. *(On demand)*

MATH 3652. Mathematics Cooperative Education Seminar. (1) Prerequisite: MATH 3551. The student will give an exposition of his/her work experience in MATH 3551. An exposition of underlying theoretical concepts and related ideas may also be required. *(On demand)*

MATH 3688. Mathematics Awareness Seminar. (0) Prerequisite: sophomore standing. Visiting speakers, discussion of internships, cooperative education and job opportunities; selected topics in mathematics. *(Fall)*

MATH 3689. Mathematics Project Seminar. (1) Prerequisite: senior standing. Oral presentation by the student on an area of mathematics or a mathematical problem. *(Fall, Spring)*

MATH 3691. Seminar. (1-6) Prerequisite: consent of the department. Readings, study and discussion designed to develop the student's ability to study independently and to present results properly. *(On demand)*

MATH 3790. Junior Honors Seminar. (3) Prerequisite: consent of the department. May be repeated once for additional credit with approval of the department. *(On demand)*

MATH 3791. Senior Honors Tutorial. (3) Prerequisite: consent of the department. Individual tutorials in which the student will pursue independent study and research in any area of mathematics under the direction of one or more faculty members. The project of the student will be planned to culminate in a research paper of original or expository nature. May be repeated for additional credit with the approval of the department. *(On demand)*

Undergraduate/Available for Graduate Credit

MATH 4000. Topics in Foundations or History of Mathematics. (2-3) (2-3G) Prerequisite: consent of the department. Topics in the foundations or the history of mathematics selected to supplement regular course offerings in this area of mathematics. May be repeated for credit with approval of the department. Credit for the M.A. degree in mathematics requires approval of the department. *(On demand)*

MATH 4040. Topics in Analysis. (2-3) (2-3G) Prerequisite: consent of the department. Topics in analysis selected to supplement regular course offerings in this area of mathematics. May be repeated for credit with the approval of the department. Credit for the M.A. degree in mathematics requires approval of the department. *(On demand)*

MATH 4060. Topics in Algebra. (2-3) (2-3G) Prerequisite: consent of the department. Topics in algebra selected to supplement regular course offerings in this area of mathematics. May be repeated for credit with the approval of the department. Credit for the M.A. degree in mathematics requires approval of the department. *(On demand)*

MATH 4080. Topics in Geometry and Topology. (3) (3G) Prerequisite: consent of the department. Topics in geometry or topology selected as to supplement regular course offerings in this area of mathematics. May be repeated for credit with approval of the department. Credit for M.A. degree in mathematics requires approval of the department. *(On demand)*

MATH 4109. History of Mathematical Thought. (3) (3G) Prerequisite: MATH 1241 or consent of the department. A study of the development of mathematics in its historical setting from the earliest beginnings to modern times. Not approved for the M.A. in mathematics degree. *(Fall) (Evenings)*

MATH 4161. Number Theory. (3) (3G) Prerequisite: MATH 3163 with a grade of *C* or better or consent of the department. A study of the elements of classical number theory including divisibility, congruences, diophantine equations, prime numbers and their distribution, quadratic reciprocity, number-theoretic functions, and famous unsolved problems. Not approved for the M.A. in mathematics degree. *(Spring) (Alternate years)*

MATH 4163. Modern Algebra. (3) (3G) Prerequisite: MATH 3163 or consent of the department. Groups, rings, integral domains, fields. *(Fall) (Alternate years)*

MATH 4164. Abstract Linear Algebra. (3) (3G) Prerequisite: MATH 3163 and 2164 or consent of the department. Vector spaces over arbitrary fields, linear transformations, canonical forms, multilinear algebra. *(Spring) (Alternate years)*

MATH 4181. Introduction to Topology. (3) (3G) Prerequisite: MATH 2164. Topics from set theory and point set topology such as cardinality, order, topological spaces, metric spaces, separation axioms, compactness and connectedness. *(Fall) (Alternate years)*

MATH 4691. Seminar. (1-6) (1-6G) Prerequisite: consent of the department. Individual or group investigation and exposition of selected topics in mathematics. *(On demand)*

MATH 4692. Seminar. (1-6) (1-6G) Prerequisite: consent of the department. A continuation of MATH 4691. *(On demand)*

Graduate and Advanced Undergraduate

MATH 5128. Applied Probability I. (3) (3G) Prerequisite: MATH/STAT 3122 and MATH 2171 or consent of the department. Finite and countable Markov chains, Markov Decision Processes, and optimal stopping. Other topics selected from: queuing theory, inventory models, reliability theory, game theory, recurrent events, information theory, stochastic control, stochastic control with incomplete information and Kalman filtering. *(Fall)(Alternate years)*

MATH 5129 Applied Probability II. (3) (3G) Prerequisite: MATH 5128 or consent of the department. Continuation of MATH 5128. *(Spring)(Alternate years)*

MATH 5143. Analysis I. (3) (3G) Prerequisite: MATH 3141 with a grade of *B* or better, or consent of the department. First course of a two-semester sequence providing a rigorous treatment of continuity, differentiability and integration of functions of one and several real variables. *(Fall)*

MATH 5144. Analysis II. (3) (3G) Prerequisite: MATH 5143 with a grade of *B* or better or consent of the department. Continuation of MATH 5143. *(Spring)*

MATH 5165. Numerical Linear Algebra. (3) (3G) Prerequisites: CSCI 1100 or 1201 and 1201L, MATH 2164 and 2171, all with a grade of C or better, or consent of the Department. Gaussian elimination and LU decomposition methods for linear systems. Vector and matrix norms, condition numbers and accuracy of solutions. Solutions of large sparse matrix systems using skyline solvers, and Jacobi, Gauss-Seidel, and SOR iterative methods. Solution of nonlinear systems. Least squares methods using the QR factorization. Selected problems will be programmed for computer solution. *(Fall) (Alternate years)*

MATH 5171. Numerical Solution of Ordinary Differential Equations. (3) (3G) Prerequisites: CSCI 1100 or 1201 and 1201L, MATH 2241, 2164, and 2171, all with a grade of C or better, or consent of the Department. Numerical solution techniques for ordinary differential equations such as Runga-kutta, multistep and extrapolation methods. Stiff solvers and stability criteria. Comparative work with modern robust codes and visualization methods. *(On demand)*

MATH 5172. The Finite Element Method. (3) (3G) Prerequisites: CSCI 1100 or 1201 and 1201L, MATH 2241, 2164, and 2171, all with a grade of *C* or better, or consent of the department. Boundary value problems and their variational form. Finite element basis functions, computational techniques, isoparametric elements and curved boundaries, alternate methods, singular problems, eigenvalue problems. Some practical experience with an F.E.M. program and graphical output. *(Spring) (Alternate years)*

MATH 5173. Ordinary Differential Equations. (3G) Prerequisites: MATH 2171, MATH 3142, or consent of the department. Existence and uniqueness theorems for initial value problems; continuous dependence of solutions on initial values and right hand sides; linear differential equations in R^2 and R^n; non-linear differential equations in R^2 and R^n; phase portraits, singularities, cycles; invariant manifolds; linearization; singularities of planar systems; Lyapunov stability; examples: van der Pol oscillator, Liénard systems, Volterra-Lotka equations. *(Spring)*

MATH 5174. Partial Differential Equations. (3) (3G) Prerequisites: MATH 2164 and 3141, or consent of department. Classification of types of partial differential equations. Separation of variables, Sturm-Liouville problems, boundary and eigenvalue problems, fundamental solutions and Green's theorem, Fourier series and integrals, Laplace transforms. *(Fall)*

MATH 5176. Numerical Methods for Partial Differential Equations. (3) (3G) Prerequisite: CSCI 1100 or 1201 and 1201L, MATH 2241, 2164, and 2171 all with a grade of C or better, or consent of the department. Basic finite difference schemes for the solutions of elliptic, parabolic

and hyperbolic equations. Van Neuman analysis, characteristics, boundary conditions. *(Fall) (Alternate years)*

Graduate Only

MATH 6004. Topics in Analysis. (3G) Prerequisite: MATH 6101 or consent of department. Topics in analysis selected so as to complement regular course offerings in this area of mathematics. May be repeated for credit with the consent of department. *(On demand)*

MATH 6008. Topics in Geometry and Topology. (3G) Prerequisite: consent of department. Topics selected from Euclidean geometry, non-Euclidean geometry, projective geometry, differential geometry, point-set topology, algebraic topology. May be repeated for credit with approval of department. *(On demand)*

MATH 6100. Foundations of Mathematics. (3G) Prerequisite: consent of department. Logic, sets and axiomatic systems. *(Fall, Summer) (Alternate years)*

MATH 6101. Foundations of Real Analysis. (3G) Prerequisite: MATH 6100 or consent of department. Axiomatic and historical development of the real and complex numbers; rigorous development of limits and continuity of functions, intermediate and extreme value theorems. *(Fall) (Alternate years)*

MATH 6102. Calculus from an Advanced Viewpoint. (3G) Prerequisite: MATH 6101 or its equivalent. A continuation of MATH 6101. A rigorous approach to differentiation and integration of functions of one real variable. *(Spring) (Alternate years)*

MATH 6103. Computer Techniques and Numerical Methods. (3G) Prerequisite: MATH 6101 or consent of department. Computer systems, programming, and the computer solution of numerical problems. *(Summer) (Alternate years)*

MATH 6105. Problem Solving in Discrete Mathematics. (3G) Prerequisite: consent of department. Propositional and predicate calculus, counting techniques, partially ordered sets, lattices, graphs and trees. *(Alternate years)*

MATH 6106. Modern Algebra. (3G) Prerequisite: MATH 3163 or its equivalent or consent of department. Topics chosen from group theory, rings and ideals, integral domains, fields and elementary Galois theory. *(Summer) (Alternate years)*

MATH 6107. Linear Algebra. (3G) Prerequisite: MATH 2164 or its equivalent or consent of department. Systems of linear equations, matrices, vector spaces, linear transformations, determinants, canonical forms of matrices, inner products. *(Summer) (Alternate years)*

MATH 6118. Non-Euclidean Geometry. (3G) Prerequisite: consent of department. History of Euclid's Fifth Postulate and attempts to prove it; work of Gauss, Bolyai, Lobachevsky and others; systematic development of hyperbolic geometry; relative consistency of hyperbolic geometry; relative consistency of hyperbolic and Euclidean geometries. *(Alternate years)*

MATH 6171. Advanced Applied Mathematics I. (3G) Prerequisites: MATH 2241 and 2171 with grades of *C* or better, or consent of department. Power series solutions of ordinary differential equations, vector calculus, line and surface integrals, partial differential equations and Fourier integrals. *(Fall) (Evenings)*

MATH 6172. Advanced Applied Mathematics II. (3G) Prerequisites: MATH 2241 and 2171 with grades of *C* or better or consent of department. Complex analysis; probability and statistics. *(Spring) (Evenings)*

MATH 6609. Seminar. (1-2-3G) Prerequisite: consent of the department. A series of regularly scheduled meetings in which each student will present one or more topics selected by the instructor. May be repeated for credit with the consent of department. *(On demand)*

Advanced Graduate Only

MATH 7028. Topics in Probability. (3G) Prerequisite: MATH 7120 and 7121, or consent of department. Topics of current interest in probability and advanced topics in probability. May be repeated for credit with the consent of the department. *(On demand)*

MATH 7050. Topics in Mathematics. (2-3G) Prerequisite: consent of department. Topics chosen from such fields as algebra, topology, analysis, applied mathematics, differential geometry, mathematical physics, graph theory, probability, statistics. May be repeated for credit as topics vary and with the approval of the department. *(On demand)*

MATH 7065. Topics in Applied Algebra and Algebraic Structures. (3G) Prerequisite: consent of the department. Current topics in Applied Algebra and Algebraic Structure. *(On demand)*

MATH 7070. Topics in Numerical Analysis. (3G) Prerequisite: consent of the department. Topics of current interest in numerical analysis. May be repeated for credit with the consent of the department. *(On demand)*

MATH 7071. Topics in Differential Equations. (3G) Prerequisite: consent of the department. Topics of current interest in ODE, PDE, dynamical systems, inverse problems and related subjects. May be repeated for credit with the consent of the department. *(On demand)*

MATH 7120. Probability Theory I. (3G) Prerequisites: MATH 7143 and MATH/STAT 3122 or consent of department. Topics include probability spaces, probability measures, sigma-algebras, characteristic functions, sequences of random variables, law of large numbers, general forms of the Central Limit Theorem. *(Fall) (Alternate years)*

MATH 7121. Probability Theory II. (3G) Prerequisite: MATH 7120 or consent of the department. A continuation of MATH 7120. *(Spring) (Alternate years)*

MATH 7125. Stochastic Processes I. (3G) Prerequisites: MATH 3122 and 7143 or consent of the department. Basic ideas in the study of stochastic processes, selected from: discrete and continuous time Markov processes, stationary and renewal processes, applications to queuing theory, reliability theory, stochastic differential equations, time-series analysis, filtering and stochastic control theory. *(On demand)*

MATH 7126. Stochastic Processes II. (3G) Prerequisite: MATH 7125. A continuation of MATH 7125. *(On demand)*

MATH 7141. Complex Analysis I. (3G) Prerequisite: MATH 5143 or consent of the department. Holomorphic functions, complex integration, residues, entire and meromorphic functions, conformal mapping, harmonic functions. *(Spring) (Alternate years)*

MATH 7142. Complex Analysis II. (3G) Prerequisite: MATH 7141. A continuation of MATH 7141. *(On demand)*

MATH 7143. Real Analysis I. (3G) Prerequisite: MATH 5144 or consent of the department. Lebesgue integration on the real line, Lp spaces, introduction to general measure and integration theory. *(Fall)*

MATH 7144. Real Analysis II. (3G) Prerequisite: MATH 7143 or consent of the department. A continuation of MATH 7143. *(Spring)*

MATH 7147. Applied Functional Analysis. (3G) Prerequisite: MATH 5144. Introduction to functional analysis and its applications to such areas as linear and non-linear differential equations, integral equations, and control theory. Topics chosen from Banach spaces, operators, the Hahn-Banach, open mapping and closed graph theorems, Sobolev spaces, spectral theory, operators in Hilbert space. *(Summer) (On Demand)*

MATH 7148. Functional Analysis. (3G) Prerequisite: MATH 7144 or consent of the department. Material selected from: spectral theory, spectral theory of differential operators, groups and semigroups of operators, nonlinear functional analysis, asymptotic analysis, integral equations, Fourier analysis, distributions, and Sobolev spaces. *(Fall)(Alternate years)*

MATH 7163. Modern Algebra I. (3G) Prerequisite: MATH 4163 and 4164 or consent of department. Topics will be selected from Galois theory, commutative algebra, modules, ring theory, homological algebra. *(Fall) (Alternate years)*

MATH 7164. Modern Algebra II. (3G) Prerequisite: MATH 7163. A continuation of MATH 7163. *(On demand)*

MATH 7172. Partial Differential Equations. (3G) Prerequisite: MATH 5174 and 7144 or consent of department. Harmonic functions, mean-value theorem, maximum principle, Green's representation for the solution of the Dirichlet problem for Laplace's equation; Poisson's equations and the Poisson formula; statement and proof of the existence theorem for general second-order elliptic operators, generalized maximum principles; Sobolev spaces. Evolution equations involving elliptic operators, such as the heat or wave equations, may also be introduced. *(Spring) (Alternate years)*

MATH 7173. Evolution Equations. (3G) Prerequisite: MATH 7144 and 7172 or consent of the department. Semigroups of operators and their generators, examples of semigroups. The heat equation, examples of elliptic operators that generate semigroups, Hille-Yosida theory, analytic semigroups; examples, fractional powers of operators. *(On demand)*

MATH 7174. Linear and Non-linear Waves. (3G) Prerequisite: MATH 5124 and 7144 or consent of the department. Hyperbolic waves, characteristics, Riemann invariants, conservation laws, weak solutions, shock structure. Burger's equation, gas dynamics, dispersive waves, group velocity, water waves, non-linear optics. *(On demand)*

MATH 7175. Inverse Problems. (3G) Prerequisite: MATH 7144 and MATH 5174 or consent of the department. Ill-posed problems and numerical methods for them. Applications of inverse problems to real processes. One dimensional inverse problems. Multi-dimensional inverse problems: uniqueness and numerical methods. Inverse scattering problems. *(On demand)*

MATH 7176. Advanced Numerical Analysis. (3G) Prerequisites: MATH 2164, 2171 and 5176 or consent of the department. A selection of topics from such areas as iterative methods of solving linear and non-linear systems of equations, approximation theory, splines, and finite element methods for partial differential equations. *(Spring) (Alternate years)*

MATH 7177. Applied Optimal Control. (3G) Prerequisites: MATH 5143 or consent of the department. Examples of control systems and optimization problems, optimal control of discrete-time systems, solutions of the general discrete-time optimization problem, optimal control of continuous-time systems, the calculus of variations, solution of the general continuous optimization problem, applications of the Pontryagin Maximum Principle, Dynamic programming, and Bang-bang control. Controllability and differential games may also be introduced. *(Spring) (Alternate years)*

MATH 7178. Computational Methods for Fluid Dynamics. (3G) Prerequisite: CSCI 1100 or 1201 and 1201L, MATH 2242, 2171, 5174 and 5176 or consent of the department. Topics on various numerical techniques for the solution of incompressible and compressible flows. Finite difference, finite element and spectral methods, and shock capturing and fitting methods. Multi-grid method and acceleration techniques. *(On demand)*

MATH 7179. Advanced Finite Difference Methods. (3G) Prerequisite: consent of the department. Accuracy analysis and design of high order schemes, stability theory of schemes with variable coefficients, stability theory of schemes for initial-boundary value problems, convergence theory for nonlinear cases. *(On demand)*

MATH 7181. Topology I. (3G) Prerequisite: consent of department. Topological spaces, continuous functions, connectedness, compactness, and metrizability, and further topics from point-set, geometric or algebraic topology. *(On demand)*

MATH 7182. Topology II. (3G) Prerequisite: MATH 7181. A continuation of MATH 7181. *(On demand)*

MATH 7184. Differential Geometry I. (3G) Prerequisite: consent of the department. Manifolds, differential structures, tangent bundles, embeddings, immersions, inverse function theorem, Morse-Sard theorem,

transversality, Borsuk-Ulam theorem, vector bundles, Euler characteristics, Morse theory, Stokes theorem, Gauss-Bonnet theorem, Whitney embedding theorem. *(On demand)*

MATH 7185. Differential Geometry II. (3G) Prerequisite: consent of the department. Differentiable manifolds, differential forms, critical points, local and global theory of curves, local and global theory of surfaces, connections, Geodeusics, curvature, spaces of constant curvature, Lie groups and Lie algebras. *(On demand)*

MATH 7273. Advanced Finite Element Analysis. (3G) Prerequisite: MATH 5172 and 5174 or consent of the department. Selection of topics from such areas of finite element analysis as convergence theorems (Ciarlet), hierarchical basis functions, the h-p method, adaptive grid techniques and solution methods for nonlinear equations. *(Fall)(Alternate years)*

MATH 7275. Dynamical Systems I. (3G) Prerequisites: MATH 5143 and MATH 5173 or consent of the department. Cycles and separatrix cycles, Poincaré firstreturn map: diffeomorphisms, Poincaré-Bendixson Theory, flows on the two-torus; structural stability, genericity, Peixoto's theorem; singularities of planar systems. Degenerate singularities, Hopf bifurcation, saddle-node bifurcation, center bifurcation. *(On demand)*

MATH 7276. Dynamical Systems II. (3G) Prerequisite: MATH 7275 or consent of the department. Method of averaging, Melnikov functions, hyperbolic structure, symbolic dynamics, homocline and heteroclinic orbits, global bifurcations, infinite dimensional dynamical systems, inertial manifolds, Lyapunov exponents and dimension of attractors, codimension-two bifurcations, Duffing's equation, Lorenz equations, finite dimensional systems of dimension at least three. *(On demand)*

MATH 7277. Bifurcation Theory. (3G) Prerequisite: MATH 7275 or consent of the department. Implicit function theorem, manifolds and transversality, Newton polygons, Lyapunov center theorem, variational methods, Ljusternik-Schnirelman theory, mountain-pass theorem, bifurcations with one-dimensional null-spaces, Morse theory and global bifurcations, geometric theory of partial differential equations. *(On demand)*

MATH 7691. Research Seminar. (1-3G) Prerequisite: consent of department. A seminar in which independent study may be pursued by the student or a group of students under the direction of a professor. *(On demand)*

MATH 7692. Research Seminar. (1-3G) Prerequisite: consent of department. A continuation of MATH 7691. *(On demand)*

MATH 7893. Thesis. (0-3G) Prerequisite: consent of department. Subject to the approval of the department Graduate Committee, the thesis may be original work, work of an expository nature, or the mathematical formulation and solution of a particular industrial or business problem suggested by the career interests of the student. The thesis must be defended in an oral presentation. May be repeated for credit with the consent of department. *(Fall, Spring, Summer)*

MATH 7994. Doctoral Research and Reading. (0-9G) Prerequisite: consent of the department. May be repeated with consent of the department. *(On demand)*

MASTER OF BUSINESS ADMINISTRATION (MBAD)

Undergraduate Preparation Courses for the MBA
ACCT 3200. Foundations in Accounting. (3)
BLAW 3200. Legal Environment in Business. (3)
ECON 3200. Foundations in Economics. (3)
INFO 3200. Foundations in Business Computing. (3)
OPER 3200. Quantitative Analysis in Business. (3)

Graduate Only
MBAD 6028. Topics in Business Information Systems. (3G) Prerequisite: MBAD 6121. Selected topics in information systems. Potential topics include information resource management, database management systems, management support systems, information systems in the financial and banking industry, information systems in manufacturing, information systems in health care, and EDP auditing. May be repeated for additional credit as the topics vary and with permission of MBA program coordinator. *(Yearly)*

MBAD 6111. Macroeconomics and Business Forecasting. (3G) Prerequisite: ECON 3200 and OPER 3200 or equivalents. Advanced studies of the interrelations of markets in national and international economies; mechanisms of monetary policy and interest rate effects, foreign exchange rates and inflation; relations between national saving, fiscal policy, the foreign debts and capital investment; short-run and long-run effects of economic policy; tax policy, government spending and economic growth; types of economic forecasts; value and limits of forecasts. *(Yearly)*

MBAD 6112. The Economics of Business Decisions. (3G) Prerequisites: ECON 3200 and OPER 3200 or equivalents. Economic concepts in the decision-making process. Topics include scarcity; marginal analysis and tools of optimization; demand and supply analysis and market structure; economic efficiency; regression analysis; risk analysis and game theory and international economic issues. *(Fall, Spring)*

MBAD 6121. Business Information Systems. (3G) Prerequisite: INFO 3200 or equivalent. Examination of how information systems are developed and used in organizations, how information resources are managed, and the potential strategic and competitive impact information systems have in domestic and global business environments. *(Fall, Spring)*

MBAD 6122. Technology-Enhanced Decision Making (3G) Prerequisite: OPER 3200 or equivalent. An analytical approach to the management process. Generalized models for decision making with major emphasis on application of the scientific method to management problems. *(Yearly)*

MBAD 6123. Applied Management Science. (3G) Prerequisite: MBAD 6122. Mathematical model building aimed at integrating methods and applications. Overview of mathematical programming in practice and a series of projects implementing models in business and the public sector. *(On demand)*

MBAD 6124. Business Information Systems Development. (3G) Prerequisite: MBAD 6121. Examination of managerial issues associated with the study of business processes and the development of supporting information systems. Emphasis on the application of appropriate methodologies, techniques, and tools to analyze, design, and implement business information systems. Study of relevant IS project management and quality assurance techniques. *(Yearly)*

MBAD 6125. Business Data Communications. (3G) Prerequisites: MBAD 6121. Examination of the information communication requirements of business environments, the fundamentals of communication technology, and the application of the technology for solving business problems. Emphasis on understanding communication technologies to assess needs, plan for the introduction of hardware and software, and manage these communication systems. *(Yearly)*

MBAD 6131. Managerial Accounting. (3G) Prerequisite: ACCT 3200 or equivalent. Management's use of accounting. Topics include profit planning and control, evaluation of performance, cost analysis, and income tax planning. *(Fall, Spring)*

MBAD 6132. Financial Reporting. (3G) Prerequisite: MBAD 6131. Preparation of general purpose financial statements with emphasis on the impact of accounting method choice and analysis by investors and creditors of the resulting statements. Participants gain an understanding of accounting theory necessary for the preparation and analysis of corporate reports. *(Yearly)*

MBAD 6133. Business Tax Strategies. (3G) Prerequisite: MBAD 6131. Tax planning concepts and strategies for businesses including an overview of the Federal tax system, sources of tax law, guidelines for organizing and financing a business, tax incentives for capital investment, and other tax planning topics. Participants learn how to avoid some common tax traps and apply the concepts and strategies in realistic business cases. (Same as ACCT 6150) *(Yearly)*

MBAD 6134. Controllership. (3G) Prerequisite: MBAD 6131. Controllership practice, including organizational status, objectives, functions, duties and responsibilities and the managerial utilization of accounting and statistical data for planning and control. (Same as ACCT 6230) *(Yearly)*

MBAD 6141. Operations Management. (3G) Prerequisite: INFO 3200 and OPER 3200 or equivalents. Design, operation, and control of service and manufacturing systems. Emphasis on using analytical tools for problem solving in process analysis and re-engineering, work-force management, material and inventory management, aggregate planning, total quality management, and others. *(Fall, Spring)*

MBAD 6142. Quality and Manufacturing Management. (3G) Prerequisite: MBAD 6141. Current issues and advances in operations management including just-in-time inventory management, total quality management, continuous improvement, flexible manufacturing systems, computer integrated manufacturing systems, technology evaluation and selection and operations strategy. *(Yearly)*

MBAD 6151. Financial Institutions and Markets. (3G) Major financial institutions, particularly commercial banks, and their role in the intermediation process and as suppliers of funds to the money and capital markets. Comparative financial policies of these institutions are examined in the context of their legal and market environment. (Same as FINN 6151) *(Yearly)*

MBAD 6152. Financial Management. (3G) Prerequisite: MBAD 6131. Theory and practice of corporate finance including asset management, cost of capital and capital budgeting, optimization problems and socio-economic aspects of financial management. Computer technology may be employed when applicable. (Same as FINN 6152) *(Fall, Spring)*

MBAD 6153. Investment Management. (3G) Prerequisite: MBAD 6152. Theory and practice of investment decisions of individuals and fund managers. Topics include the status of capital market theory, the efficient market hypothesis literature, and a portfolio performance measurement. Standard institutional and investment analysis topics, futures and options markets, and international investment topics are covered. (Same as FINN 6153) *(Yearly)*

MBAD 6154. Current Topics in Financial Management. (3G) Prerequisite: MBAD 6152. Examination of business finance topics currently being discussed in the business media and development of advanced analytical skills in those topic areas. Topics will change depending upon the business environment. The following topics form the basis of the course: lease vs. buy (borrow); leveraged buy-outs; merger analysis; international operations of American firms (capital budgeting); and capital structure decisions. (Same as FINN 6154) *(On Demand)*

MBAD 6155. Multinational Financial Management. (3G) Prerequisites: MBAD 6111 and 6152. Financial management of the multinational firm including management of foreign exchange risk and political risk, and the control and evaluation of financial policies of multinational firms. (Same as FINN 6155) *(Yearly)*

MBAD 6156. Commercial Bank Management. (3G) Prerequisite: MBAD 6152. Techniques for the management of commercial banks. Topics of study include industry structure, administrative organization, management of assets, liabilities, and capital, and financial analysis of the banking firm. (Same as FINN 6156) *(Yearly)*

MBAD 6157. Theory of Corporate Finance. (3G) Prerequisite: MBAD 6152. Theories of modern corporate finance, including theory of efficient capital markets; uncertainty and the theory of choice; market equilibrium asset pricing models (capital asset pricing model, arbitrage pricing theory, Black-Scholes); theories of capital structure

and the cost of capital; dividend policy; and leasing. (Same as FINN 6157) *(Yearly)*

MBAD 6161. Organizational Leadership and Behavior I. (3G) Behavioral knowledge and skills essential to becoming an effective manager/leader including behavior and motivation in an environment of complexity and rapid change and ethical implications of actions and their effects on demographically diverse and increasingly international work force. *(Fall, Spring)*

MBAD 6162. Organizational Leadership and Behavior II. (3G) Prerequisite: MBAD 6161. Continuation of MBAD 6161 Examines performance determinants and appraisal, design of complex organizations, team building, organizational change, career development and conflict management. *(Yearly)*

MBAD 6163. Human Resource Management. (3G) Prerequisite: MBAD 6161. An examination of the current critical issues and strategic questions associated with managing employees. Case material, readings and audiovisual material will be used to stimulate discussion of the most important and strategic questions to be tackled by general managers today and in the future in the relationship between management and workers. *(Yearly)*

MBAD 6164. Executive Communication (3G) Intensive study of communication in organizations from middle and upper management perspectives with special attention to corporate communication, media relations, technologically mediated communication, crisis communication and public affairs. Case studies, readings and project assignments will be used in a variety of business situations. *(Yearly)*

MBAD 6171. Marketing Management. (3G) A managerial approach to strategic marketing decision making. Topics include promotional strategy, channels of distribution, demand analysis and pricing, and international marketing. Case studies, readings and simulations are used. *(Fall, Spring)*

MBAD 6172. Marketing Research. (3G) Prerequisite: MBAD 6171. Planning, execution and evaluation of marketing research activities. Emphasis on the techniques and methodology used in the collection, analysis and interpretation of economic, demographic and sociological data for use in marketing decision making. *(Yearly)*

MBAD 6173. Promotional Strategy. (3G) Prerequisite: MBAD 6171. Opportunities and challenges for an organization through advertising, personal selling, sales promotion and publicity. It includes analysis of the legal and ethical problems involved in this area. Case studies and a project assignment are used. *(Spring)*

MBAD 6174. International Marketing. (3G) Prererequisite: MBAD 6171 or consent of instructor. Study of opportunities, problems and techniques involved in marketing internationally. Analysis of environmental forces which affect international marketing and the methods companies utilize to market effectively on an international scale. *(Yearly)*

MBAD 6175. Logistics Management. (3G) Prerequisite: MBAD 6171 or permission of the instructor. Study of the logistics system as a source of profitability and competitive advantage. Component activities (customer service, inventory, storage, transportation) are examined individually and as parts of a larger whole, with emphasis on effective management of the overall system of finished goods distribution. Special attention is given to managing the transportation function in a deregulated environment. *(Yearly)*

MBAD 6191. Entrepreneurship. (3G) Prerequisites: MBAD 6131, 6152, 6171, or permission of the MBA coordinator or the instructor. An examination of entrepreneurship and entrepreneurs. Focus on planning the start-up of a fast-growth enterprise with the aim of rewarding the founders and initial investors with significant capital gains. Extensive use of case studies will provide a background of classroom activities to assist students in the preparation of a detailed plan for the hypothetical start-up of a fast-growth firm. *(Yearly)*

MBAD 6192. Business and Society. (3G) Ethical, moral, political and social aspects of policy formulation and implementation. Management's responsibilities to consumers, employees, investor/owners, and society are stressed. Case studies are used. *(Yearly)*

MBAD 6193. International Business Concepts. (3G) Prerequisites: MBAD 6152, 6171, or permission of the MBA Program Coordinator. An overview of international business management. Specifically, the functional areas of business are covered to provide an international perspective. *(Yearly)*

MBAD 6194. Management Policy. (3G) Prerequisite: All courses in the primary and intermediate block of the Functional Component or permission of the MBA coordinator. Examination of the need to integrate the functional activities of the firm in planning corporate objectives and achieving operating results. Emphasis on ability to identify issues and problems of the firm as a whole, to explore alternatives and to make decisions which recognize the interrelationships of the functional specialties within the total organization. Application and integration of knowledge and skills of analysis developed in the preceding courses of the MBA program. *(Fall, Spring)*

MBAD 6195. Strategic Management of Technology. (3G) Prerequisites: MBAD 6141, 6152, and 6171. Impact of changing technology upon industries and companies and the consequent challenges for business managers. Major topics include: the historical context of change and innovation; organization and innovation; technology and business strategy; impact on functional areas; managing linkages; venturing and organization learning; government influence on innovation; executive leadership; the management of innovation and change. A comprehensive written report covering a significant aspect of emerging technology is required. *(On demand)*

MBAD 6196. Strategic Planning. (3G) Prerequisite: MBAD 6194. Strategic planning within a rapidly changing environment including changing industry conditions as well as technological, social, political and economic changes. Examination of strategic planning techniques being developed by researchers and by corporate practitioners. *(Yearly)*

MBAD 6197. International Business Strategy. (3G) Prerequisites: MBAD 6152 and 6171. Management challenges associated with the development of international strategies and the management of organizations in business enterprises whose operations stretch across national boundaries; how multinational enterprises (MNEs) work. Case studies, projects, and presentations are used to help students apply concepts and theories. *(Yearly)*

MBAD 6198. Professional Applications. (3G) Prerequisites: Completion of the Functional Component. Team-taught, multidisciplinary course based on (1) structured, written cases and (2) contemporary management problems/issues presented in a non-structured, non-case format. Requires formal written position papers evaluating current business problems which are presented and defended before an audience of peers, faculty members, and business leaders. *(Fall, Spring)*

MBAD 6500. Cooperative Education Experience. (0G) Prerequisite: Completion of nine hours of graduate coursework. Participation in the Co-op Program enables MBA students to pursue practical work experience that is complementary to their major course of studies. Each student's program must be approved by the coordinator of the MBA program. *(Fall, Spring)*

MBAD 6890. Directed Individual Study. (3G) Directed individual study and in-depth analysis of a special area of management, economics, business or accounting. The course may be used to satisfy up to six semester hours of graduate credit requirements in the Master of Business Administration degree program and may be repeated for credit provided a different area of study is undertaken each time. Permission of a member of the graduate faculty who would direct the study and permission of the MBA program coordinator must be secured before registering for the course. *(Fall, Spring)*

MIDDLE GRADES EDUCATION (MDLG)

Undergraduate

MDLG 3130. The Early Adolsecent Learner. (4) Prerequisite: Admission to Teacher Education. Physical, sexual, social, cognitive, and emotional development in the 10-15 year old with emphasis on how these developmental diversities affect the middle grades classroom. Includes 40 hours of field experiences. *(Fall)*

MDLG 3131. The Philosophy and Curriculum of Middle Grades Education. (4) Prerequisites: MDLG 3130, admission to Teacher Education. Overview of education in the middle grades (6-9) with emphasis on the foundational components, organizational patterns, instructional programs, and integrated curriculum unique to the middle school. Includes 40 hours field experiences. *(Spring)*

MDLG 3430. Student Teaching/Seminar: 6-9 Middle Grades Education. (15) Prerequisite: Approval of an Application for Student Teaching. Planned sequence of experiences in the student's two areas of content specialization conducted in an approved middle school setting under the supervision and coordination of a university supervisor and a cooperating teacher in which the student must demonstrate the competencies identified for his/her specific teaching fields in appropriate grade-level settings. Approximately 35 to 40 hours per week in an assigned school setting, teaching in two areas of concentration; and 10-12 on-campus seminars scheduled throughout the semester. *(Fall, Spring)*

MDLG 3800. Individual Study in Middle Grades Education. (1-6) Prerequisite: Permission of the student's adviser. Independent study under the supervision of an appropriate faculty member. May be repeated for credit. *(Fall, Spring, Summer)*

Graduate and Advanced Undergraduate

MDLG 5000. Topics in Middle Grades Education. (1-6) (1-6G) May include classroom and/or clinical experiences in the content area. With department approval, may be repeatcd for credit for different topics. *(Fall, Spring, Sunmer)*

Graduate Only

MDLG 6000. Topics in Middle Grades Education. (1-6G) May include classroom and/or clinic experiences in the content area. With department approval, may be repeated for credit for different topics. *(Fall, Spring, Summer)*

MDLG 6225. Issues in Middle Grades Education. (3G) Examination of educational practice in the middle grades (6-9) including trends and issues unique to the middle grades. Emphasis on broadening understanding of foundational components, organizational patterns, instructional programs and management techniques. *(Spring) (Evening)*

MDLG 6471. Middle Grades Education Clinical Experience. (3G) Program of learning activities in the student's level and/or area of academic concentration in an approved school setting (6-9). *(On demand)*

MDLG 6473. Middle Grades Internship and Seminar. (3-6G) Supervised clinical activities to develop and assess the student's ability to observe, analyze and recommend changes for curriculum and instruction in the middle grades classroom. *(Fall, Spring)*

MDLG 6800. Individual Study in Middle Grades Education. (1-6G) Prerequisite: Permission of the student's adviser. Independent study under the supervision of an appropriate faculty member. May be repeated for credit. *(Fall, Spring, Summer)*

MDLG 7999. Graduate Residence. (0G) Meets Graduate School requirement for continuous enrollment during completion of a capstone project or comprehensive examination. *(Fall, Spring)*

MIDDLE, SECONDARY, AND K-12 EDUCATION (MDSK)

Undergraduate

MDSK 3150. Research and Analysis of Teaching Middle and Secondary School Learners. (3) Prerequisites: EDUC 2100, SECD 2140, SPED 2100, and admission to Teacher Education. Corequisite: SECD 3141. Concepts, methods, and practices used by effective teachers in their daily classroom routines, including systematic observation skills, interpretation of observation data, and application of research-based findings. Includes 10 hours of field experiences. *(Fall, Spring)*

MDSK 3151. Instructional Design and the Use of Technology with Middle and Secondary School Learners. (3) Prerequisite: EDUC 2100, SECD 2140, SPED 2100, and admission to Teacher Education. Setting goals and objectives for instruction; planning activities and writing assessments based on objectives; use of computer software for the creation of units, lesson plans, and teacher-made tests. *(Fall, Spring, Summer)*

MDSK 3160. Learning and Development: Birth through Adolescence. (3) Prerequisites: EDUC 2100, SPED 2100, and admission to Teacher Education. Theories of learning and development and a systematic examination of childhood and adolescence, with particular attention to biological, social, and cognitive areas of child development. Includes 10 hours of field experiences. *(Fall, Spring)*

MDSK 3161. K-12 Curriculum Studies. (3) Prerequisites: EDUC 2100, SPED 2100, and admission to Teacher Education. Curriculum planning and development skills with emphasis on relating school content and skills to societal and individual needs, designing and implementing integrated activities, and examining the nature and functions of schools. *(Fall, Spring)*

MDSK 3251. Teaching Science to Middle and Secondary School Learners. (3) Prerequisites: EDUC 2100, SECD 2140, SPED 2100, and admission to Teacher Education. Corequisites: SECD 3142 and SPED 3290. Preparation to teach science at the middle and secondary school levels with emphasis on a holistic, interdisciplinary understanding of science; science as related to everyday life and society; and interdisciplinary aspects of science. Includes 15 hours of field experiences. *(Fall, Spring)*

MDSK 3253. Teaching Social Studies to Middle and Secondary School Learners. (3) Prerequisites: EDUC 2100, SECD 2140, SPED 2100, and admission to Teacher Education. Corequisites: SECD 3142 and SPED 3290. A methods course for teaching social studies at the middle and secondary school levels. Emphasis on using social science content to develop effective teaching strategies, instructional plans, and classroom materials for teaching social studies to middle and secondary school students. Includes 15 hours of field experiences. *(Fall, Spring)*

MDSK 3469. Student Teaching/Seminar: K-12 Foreign Language. (15) Approval of an Application for Student Teaching. A planned sequence of experiences in the student's area of language specialization (French, German, or Spanish) conducted in an approved school setting under the supervision and coordination of a university supervisor and a cooperating teacher. Students must demonstrate the competencies identified for their language field in two different grade level settings, initially at the elementary level and subsequently at either the middle or secondary school level. Approximately 35-40 hours per week in an assigned school setting and 10-12 on-campus seminars scheduled throughout the semester. *(Fall, Spring)*

Graduate Only

MDSK 6220. Adolescence and Learning. (3G) Study of adolescence as a phase of development and its relationship to the learning process. *(Fall)*

MDSK 6250. Issues in 6-12 Science Education. (3G) Orientation to content, curriculum and methods appropriate for teaching science. Emphasis is on a critical examination of current trends and practices in the teaching of science. *(On demand)*

MDSK 6251. Issues in 6-12 Mathematics Education. (3G) Orientation to content, curriculum and methods appropriate for teaching mathematics. Emphasis is on a critical examination of current trends and practices in the teaching of mathematics. *(On demand)*

MDSK 6254. Issues in 6-12 Social Studies Education. (3G) Current issues in teaching and learning social studies. Emphasis on current trends in curriculum, advanced instructional methods, and research. *(On demand)*

MECHANICAL ENGINEERING TECHNOLOGY (MEET)

See Engineering Technology

MECHANICAL ENGINEERING (MEGR)

Undergraduate

MEGR 1156. Mechanical Engineering Graphics Design. (1) Engineering drawing emphasizing use of CAD software. Topics include projection systems, auxiliary views, dimensioning and editing. *(Spring) (Evenings)*

MEGR 2156. Design Projects Laboratory 1. (2) Prerequisites: PHYS 2102, ESGR 2141, and MATH 2241. Corequisite: MEGR 2180. Introduction to design and fundamentals of manufacturing, including computer-aided manufacturing (CAM) with emphasis on design visualization, functional analysis, and design prototyping. Student designs will be manufactured to verify design concepts. *(Fall, Spring)*

MEGR 2180. Manufacturing Systems. (4) Prerequisites: PHYS 2102L, ESGR 2141, and MATH 2241. Corequisite: MEGR 2156. Manufacturing materials, processes, and procedures, including mechanical behavior and physical properties, basic materials, casting, rolling, forming, welding, cutting, surfaces, engineering metrology, quality assurance, and automation, engineering economics, cost estimating, and economics of manufacturing. *(Fall, Spring)*

MEGR 3090. Special Topics in Mechanical Engineering. (1-4) Prerequisite: consent of the department. Technical Elective. Builds upon and synthesizes knowledge students have gained from the mechanical engineering core

curriculum. Specific topics in each offering of the course serve as the vehicle for teaching engineering analysis, synthesis and design, while simultaneously affording an opportunity for the students to point themselves toward an area of specialization. May be repeated for credit. *(On demand)*

MEGR 3111. Thermodynamics I. (3) Prerequisite: MATH 2171. Corequisite: MEGR 3121. First and second laws of thermodynamics. Work and heat carnot cycle. Ideal and real gases. Nonreactive mixture of gases. Availability and irreversibility. *(Fall, Spring, Summer) (Evenings)*

MEGR 3112. Thermodynamics II. (3) Prerequisite: MEGR 3111, with a grade of *C* or better. General thermodynamic relations; equations of state and generalized charts. Combustion, dissociation and chemical equilibrium. Introduction to power cycles. *(Spring, Summer)*

MEGR 3114. Introduction to Fluid Mechanics. (3) Prerequisites: MEGR 3121. Basic concepts of a fluid and the fundamentals of ideal and real fluid flow. Topics include fluid statics, conservation principles, Bernoulli's equation, fluid flow in pipes, and measurement devices. *(Fall, Spring, Summer) (Evenings)*

MEGR 3116. Introduction to Heat Transfer. (3) Prerequisite: MEGR 3111, with a grade of C or better. One and two dimensional steady state conduction. Finite difference methods. Radiative heat transfer, emissivity, black body radiation. Heat exchange among two and multi-body systems. Convective heat transfer. *(Spring)*

MEGR 3121. Dynamics Systems I. (3) Prerequisites: ESGR 2141 and MATH 1242, both with a grade of C or better. The kinematics and kinetics of rigid bodies. Work-energy and impulse-momentum principles and conservation laws. Introduction to the kinematics of mechanisms. *(Fall, Spring)*

MEGR 3122. Dynamic Systems II. (3) Prerequisites: MEGR 3121 and MATH 2171, both with a grade of C or better. Modeling of mechanical dynamic systems. Vibration of lumped mass systems. Analysis and design of mechanical systems using time domain and frequency domain methods. *(Spring, Summer)*

MEGR 3152. Mechanics and Materials Laboratory. (1) (W) Prerequisite: ESGR 2144, MEGR 3161 and 3171L, all with a grade of C or better. Corequisite: MEGR 3122. Laboratory experiments related to the areas of mechanics and materials engineering. Three hours of laboratory work per week. *(Fall, Spring) (Evenings)*

MEGR 3156. Design Projects Lab II. (2) Prerequisite: MEGR 2156, with a grade of C or better. Design and reduction to practice of engineering concepts in a team environment. Topics include requirements definition, concept synthesis, concept evaluation, project planning and execution. *(Spring)*

MEGR 3161. Introduction to Engineering Materials. (3) Prerequisites: CHEM 1251 and MATH 2171. Classifications of engineering materials. Introduction to property structure relationships. Ideal and defect atomic structures of solids with examples from metals, ceramics and polymers. Cold working and annealing effects. Phase equilibria in alloys; introduction to diffusional processes and transformation kinetics. *(Fall)*

MEGR 3162. Mechanical Behavior and Strengthening of Solids. (3) Prerequisite: MEGR 3161, with a grade of *C* or better. Technical Elective. Mechanical properties of materials including elastic behavior, plastic flow, fracture, creep, fatigue, elevated temperature effects. Correlation of properties with atomic and microscopic structure. Dislocation theory and its application to mechanical behavior and strengthening mechanisms. Alloy hardening effects; effects of processing and heat treatments. Applications in Fe-C alloys. *(Spring)*

MEGR 3171. Introduction to Measurements and Instrumentation. (2) Prerequisite: EEGR 2161, with a grade of C or better. Corequisite: MEGR 3171L. Statistical analysis of experimental data, curve fitting. Operational amplifiers and signal conditioning techniques for remote monitoring. Computer data acquisition, interfaces and techniques, RS-232 and GPIB interface buses. Principles in use of sensors and transducers in measurements of linear and angular displacement, velocity and acceleration, temperature, force, pressure, torque and flow, dynamic measurements and frequency analysis. *(Fall, Spring)*

MEGR 3171L. Instrumentation Laboratory. (2) (W) Prerequisite: PHYS 2102L and ENGL 2116 with a grade of C or better. Corequisite: MEGR 3171. Utilization of measuring equipment targeted to mechanical engineering applications including instrumentation and computer interfacing methods for the optimization of measurement processes, and basic programming of scientific instruments. *(Fall, Spring)*

MEGR 3210. Automotive Power Plants. (3) Prerequisite: MEGR 3112, with a grade of *C* or better. Technical Elective. Energy analysis of internal and external combustion engines for vehicular propulsion. Thermodynamic principles for combustion efficient use of fuel combustion, different types of fuel use, and pollutant control. *(Alternate years)*

MEGR 3212. Heat Convection and Compact Heat Exchanger Design. (3) Prerequisites: MEGR 3114 and 3116, both with a grade of C or better. Technical Elective. Natural, forced internal and external heat convection, heat convection in phase change (boiling and condensation) and design of compact heat exchangers. *(On demand)*

MEGR 3214. Refrigeration and Air Conditioning. (3) Prerequisites: MEGR 3112 and 4111, both with a grade of *C* or better. Technical Elective. Thermodynamics and heat transfer applied to analysis, design of cooling/heating systems. *(Spring)*

MEGR 3216. Thermal/Fluid Design. (3) Prerequisites: MEGR 3114 and 3116, both with a grade of C or better. Design of systems utilizing thermodynamic, heat transfer, and fluid flow principles. Topics include thermal system design, thermodynamic modeling, design applications with

heat transfer, thermoeconomic optimization of simple and complex systems. *(Spring)*

MEGR 3221. Machine Analysis and Design I. (3) Prerequisite: MEGR 3122 and ESGR 2144, both with a grade of *C* or better. Technical application of basic principles of mechanical science to analysis of machines and mechanical systems. Design of typical machine elements. Strength and deflection requirements. *(Fall)*

MEGR 3222. Machine Analysis and Design II. (3) Prerequisite: MEGR 3221, with a grade of *C* or better. Technical Elective. Synthesis of machines and mechanical systems. Analysis, creative design and selection of machines and machine elements. *(Spring)*

MEGR 3251. Thermal/Fluids Laboratory. (1) (W) Prerequisites: MEGR 3111, 3114, and 3171L, all with a grade of C or better. Laboratory experiments in thermodynamics, fluid mechanics and heat transfer. Three laboratory hours per week. *(Fall, Spring) (Evenings)*

MEGR 3255. Senior Design I. (2) Prerequisite: MEGR 3156 and 3152, both with a grade of C or better. Corequisites: MEGR 3251 and senior standing in mechanical engineering. First of a two-semester sequence leading to a major integrative experience in applying the principles of design and project management to the design of a major mechanical engineering system, emphasizing teamwork and communication skills. *(Fall)*

MEGR 3256. Senior Design II. (2) Prerequisite: MEGR 3255 with a grade of C or better. Continuation of MEGR 3255 including project execution leading to an oral presentation and final written report. *(Fall, Spring)*

MEGR 3281. Numerical Control of Manufacturing Processes. (3) Prerequisite: MEGR 3180. Technical Elective. Fundamental theory and application of numerically controlled machine tools including design principles, elements of machine structure, control systems, programming methods. Role of numerical control in flexible manufacturing systems. Two lectures and a two hour lab per week. (Fall)

MEGR 3282. Metrology and Statistical Process Control. (3) Prerequisite: MEGR 3171. Introduction to metrology. Measurement of size, form and surface texture. Introduction to quality control, control charts for attributes and variables, acceptance sampling. Process capability estimation and process control. (Spring)

MEGR 3299. Professional Development. (1) An examination of various aspects of engineering as a profession. The course will be graded on a *Pass/No Credit* basis. *(Fall, Spring)*

MEGR 3695. Mechanical Engineering Cooperative Education Seminar. (1) Required of Co-op students during semesters immediately following each work assignment for presentation of engineering reports on work done the prior semester. *(Fall, Spring, Summer)*

MEGR 3890. Individualized Study. (1-3) Prerequisite: consent of the department. Supervised individual study within an area of a student's particular interest which is beyond the scope of existing courses. May be repeated for credit. *(On demand)*

MEGR 3990. Undergraduate Research. (1-4) Prerequisite: consent of the department. Technical Elective. Independent study of a theoretical and/or experimental problem in a specialized area of mechanical engineering. Topics originate from the student or the faculty member supervising the study. May be repeated for credit. *(On demand)*

Undergraduate/Available for Graduate Credit

Additional work required for graduate credit.

MEGR 4112. Intermediate Fluid Mechanics. (3) (3G) Prerequisites: MEGR 3111 and 3114, both with a grade of *C* or better. Technical Elective. A continuation of MEGR 3114. Topics include boundary layers, flow over body surfaces, compressible flow, turbomachinery and propulsion devices. (*Alternate years*)

MEGR 4113. Energy Conversion I. (3) (3G) Prerequisites: MEGR 3112 and 3114, both with a grade of *C* or better. Technical Elective. Corequisite: MEGR 4111. Application of principles of thermodynamics, fluid flow and heat transfer to internal combustion engines, compressors, turbines, heat exchangers, refrigeration, cryogenics. *(Fall)*

MEGR 4127. Introduction To Robotics. (3) (3G) Prerequisites: EEGR 3101, or senior standing in ME/ES or EE department. Technical Elective. Modeling of industrial robots, homogeneous transformations, static forces, kinematics, velocities, dynamics, computer animation of dynamic models, motion trajectory planning, and introduction to vision, sensors and actuators. (Dual-listed with EEGR 4161.) *(Fall)*

MEGR 4143. Discrete Mechanical Vibrating Systems. (3) (3G) Prerequisites: MEGR 3122 with a grade of *C* or better. Technical Elective. Free and forced vibrations of lumped parameter systems with multi-degrees of freedom. Topics include transient and steady state response, determination of natural frequencies and mode shapes with and without damping. Introduction to principal coordinates and matrix iteration techniques. *(Fall)*

MEGR 4144. Intermediate Dynamics. (3) (3G) Prerequisites: MEGR 3121 and MATH 2171, both with a grade of *C* or better. Technical Elective. Further studies in dynamics of particles and rigid bodies, with engineering applications. Introduction to Lagrange's equations of motion. Multi-degree-of-freedom vibrations. (*Alternate years*)

Graduate and Advanced Undergraduate

The 5000-level courses are first-year graduate courses although some advanced seniors may enroll with permission of the department.

MEGR 5090. Special Topics. (1-6) (1-6G) Directed study of current topics of special interest. May be repeated for credit. *(On demand)*

MEGR 5108. Finite Element Analysis and Applications. (3) (3G) Prerequisites: MEGR 5141 and MATH 6171 or permission of department. An introduction to the finite element method and its application to engineering problems. Application of the displacement methods to plane stress, plane strain, plate bending and axisymmetrical bodies. Topics may include but are not limited to: dynamics, heat conduction, and structural mechanics. (Dual-listed with CEGR 5108). *(Spring)*

MEGR 5111. Advanced Engineering Thermodynamics. (3) (3G) Prerequisites: MEGR 3112 and MATH 3142. Postulational treatment of the laws of thermodynamics. Equilibrium and maximum entropy postulates. Development of formal relationships and principles for general systems. Applications to chemical, magnetic, electric, and elastic systems. *(On demand)*

MEGR 5113. Dynamics and Thermodynamics of Compressible Flow. (3) (3G) Prerequisites: MEGR 3111 and 3114. Compressible flow equations, isentropic flow, normal shock waves, Fanno and Rayleigh line flows. Nonsteady one dimensional flow. (*Alternate years*)

MEGR 5118. Thermal Environmental Engineering. (3) (3G) Prerequisite: MEGR 4111. Application of the thermodynamic and heat transfer principles to the analysis of thermal environmental systems. Topics include thermodynamic properties of moist air, psychometric charts, transfer processes, heating and cooling of moist air, coils, physiological effects of thermal environments, food processing and storage. (*Alternate years*)

MEGR 5121. Mechanism Analysis. (3) (3G) Prerequisite: MEGR 3221 or consent of department. Analysis of coplanar and spatial mechanisms, application of matrix methods in analysis of mechanisms, mobility analysis of mechanisms, rigid body guidance, computer aided analysis of mechanisms. *(Spring) (Evenings)*

MEGR 5125. Vibrations of Continuous Systems. (3) (3G) Prerequisite: MEGR 4143. Analysis of vibration of continuous linear elastic structures such as strings, rods, beams and plates with varying boundary conditions. Approximate solution techniques such as Rayleigh, Rayleigh- Ritz and Galerkin are presented. (*Alternate years*)

MEGR 5127. Computer-Aided Manufacturing. (3) (3G) Prerequisites: MEGR 3255 or consent of department. Topics covered include flowline production, numerical control, computer aided process monitoring and control, group technology, flexible manufacturing, and material requirement planning. (*Alternate years*)

MEGR 5128. Control of Robotic Manipulators. (3) (3G) Prerequisites: MEGR 4127 or EEGR 4151. Control of industrial robots including linear, nonlinear, and adaptive control of the motion of robots; plus control of forces and torques exerted by the end-effector. Additional topics include computer animation of the controlled behavior of industrial robots, actuators and sensors, robot vision and artificial intelligence, and control computer/robot interfacing (dual-listed with EEGR 5151). *(Spring)*

MEGR 5141. Theory of Elasticity I. (3) (3G) Prerequisite: MEGR 3221 or equivalent. Introduction to the theory of elastic media; the fundamentals of stress, strain, stress-strain relationships, compatibility and equilibrium. Applications to two- and three-dimensional problems. Structural mechanics and energy methods. (*Alternate years*)

MEGR 5146. Experimental Stress Analysis. (3) (3G) Prerequisite: MEGR 5141 or consent of department. Theoretical and experimental techniques of stress and strain analysis, with experimental emphasis on strain gages and instrumentation. Brittle coatings and photoelasticity are also considered. Two lectures and a two-hour lab per week. (*Alternate years*)

MEGR 5181. Engineering Metrology (3) (3G) Prerequisite: MEGR 3282. Introduction to metrology and standards. Uncertainty, precision and accuracy in metrology. Measurement of size and form, computational methods in measurement of form. Measurement of surface texture and out of roundness. Machine tool and robot accuracy and calibration. Evaluation of screw threads and gears. Introduction to design of precision instruments. (Fall)

MEGR 5182. Machine Tool Metrology. (3) (3G) Prerequisites: MEGR 3180, 3281, and 5181. Machine tool accuracy and performance testing. Modeling and measurement of volumetric accuracy using parametric error separation and quasi-static error models. Use of homogeneous transformations for error mapping. Linear and higher order thermal models. Error budgeting and management. Axis of rotation metrology, spindle accuracy, and cutting performance tests. Laboratory experience on CNC machine tools using heterodyne laser interferometers, capacitance gages, and other computer assisted sensor systems for machine checking. (Spring)

MEGR 5892. Individualized Study and Projects. (1-6) (1-6G) Individual investigation and exposition of results. May be repeated for credit. *(On demand)*

Graduate Only

MEGR 6090. Special Topics. (1-6G) Directed study of current topics of special interest. May be repeated for credit. *(On demand)*

MEGR 6111. Convective Heat Transfer. (3G) Prerequisites: MEGR 4111 and 4112. Heat and momentum transfer prediction in channel flows and boundary layers. Differential equation methods for fully developed and entry length laminar tube flows. Similarity solutions for laminar heat transfer. Superposition methods for non-uniform boundary conditions. Integral equations of the boundary layer, approximate and semiempirical methods of solution. (*Alternate years*)

MEGR 6112. Radiative Heat Transfer. (3G) Prerequisite: MEGR 4111. Fundamentals of radiation heat transfer, analysis of gray body and wavelength dependent systems; radiation from gases at high temperature, and particulate-laden gases; combined radiation and conduction. *(On demand)*

MEGR 6113. Advanced Conductive Heat Transfer. (3G) Prerequisite: MEGR 4111. Theory of steady and unsteady heat conduction in isotropic and anisotropic media. Treatment of concentrated and distributed heat sources. Application of the finite difference and finite element methods. (*Alternate years*)

MEGR 6114. Advanced Fluid Mechanics. (3G) Prerequisite: MEGR 4112 or consent of department. Unified tensorial-theoretical treatment of the transport of mass, momentum, energy and vorticity in fluids. General theorems for inviscid and irrotational flows. Viscous effects, boundary layer theory, nonlinear phenomena, hydrodynamic instability and turbulence with applications. *(On demand)*

MEGR 6120. Bearing Design and Lubrication. (3G) Prerequisite: MEGR 3222 or consent of department. Hydrodynamic lubrication, fluid film and rolling element bearings, design and control of gas and fluid lubricated bearings. *(On demand)*

MEGR 6121. Mechanism Synthesis. (3G) Prerequisite: MEGR 5121 or consent of department. Synthesis of coplanar and spatial mechanisms, number and type synthesis, function generator, path generator, optimal synthesis of mechanisms, case studies in optimal design of mechanisms. (*Alternate years*)

MEGR 6123. Mechanical Design. (3G) Prerequisite: MEGR 5141 or consent of department. Impact loading on critical sections, fatigue consideration, stress concentration, fluctuating stresses, failure analysis, contact stresses, industrial case studies. *(On demand)*

MEGR 6126. Dynamics of Machinery. (3G) Prerequisite: MEGR 3222 or consent of department. Application of dynamics of machinery, balancing of rigid and flexible rotors. Dynamics of spatial mechanisms. Computer-aided dynamic analysis of machinery. *(On demand)*

MEGR 6141. Theory of Elasticity II. (3G) Prerequisites: MEGR 5141 and MATH 6172. Continuation of MEGR 5141 with additional topics in three-dimensional analyses. Topics include complex variable techniques, variational methods and numerical techniques. *(On demand)*

MEGR 6142. Inelastic Behavior of Materials. (3G) Prerequisite: MEGR 5141 or consent of department. Introduction to plasticity and linear viscoelasticity. Topics include a study of yield criteria, plastic stress-strain relations, plastic hinge analysis, discrete viscoelastic models, the hereditary integral and selected boundary value problems. (*Alternate years*)

MEGR 6145. Advanced Topics in Dynamics. (3G) Prerequisite: consent of department. Selected advanced topics in dynamics such as Lagrangian dynamics, vibrations of continuous media, stress wave propagation and motion measurement. *(On demand)*

MEGR 6181. Design of Precision Machines and Instrument I. (3G) Prerequisites: MEGR 3221 and 5182. Basic patterns in the design of precision machines and instruments. Design process, error assessment and examples, materials, sensors, drives, and controls for precision machines. Machine frames, sliding and rolling element bearings, flexures, hydrostatic bearings. Design methodology, analysis of potential designs, design case studies, and modeling of design alternatives. (Fall)

MEGR 6182. Design of Precision Machines and Instrument II. (3G) Prerequisite: MEGR 6181. Application of principles, methodology, and analysis to specific design problems. Management of design. Class will design machine components, subsystems or whole instruments either individually or as members of design teams. Critical design reviews will be conducted. Designs will be quantitatively analyzed for conformance to design specifications and intent. (Spring)

MEGR 6892. Individualized Study and Projects. (1-6G) Individual investigation and exposition of results. May be repeated for credit. *(On demand)*

MEGR 6991. Graduate Thesis Research. (1-6G) Individual investigation culminating in the preparation and presentation of a thesis. May be repeated for credit. *(Fall, Spring)*

MEGR 7999. Graduate Residence. (0) Required of all master's students not enrolled in other graduate courses who are working on or defending theses/projects and/or are scheduled for comprehensive examinations. (*Fall, Spring*)

MEGR 8999. Doctoral Dissertation Research. (0-9G) Individual investigation culminating in the preparation and presentation of a doctoral dissertation. *(On demand)*

MANUFACTURING ENGINEERING TECHNOLOGY (MFET)
See Engineering Technology

MANAGEMENT (MGMT)

Undergraduate
MGMT 1140. Introduction to Business. (3) Prerequisite: less than 45 hours earned. Fundamentals of business including marketing, management, production, accounting, finance, economics, information systems and other business areas. A general elective course that does not satisfy a requirement for any concentration or major in the Belk College of Business Administration. *(Fall, Spring)*

MGMT 2140. Introduction to Health Services Administration. (3) Prerequisite: sophomore standing. An overview of the business functions and administration of health services organizations. Topics covered include: management, marketing, information technology, finance and accounting issues as they relate to the health services industry. *(Spring)*

MGMT 3000. Topics in Management. (3) Prerequisite: junior standing. Topics from the area of Management and Administration. The course may be repeated for credit. (*On demand*)

MGMT 3140. Management Concepts and Practice. (3) Prerequisites: ACCT 2121, 2122; ECON 2101, 2102;

junior standing. Study of the role of the contemporary manager with emphasis upon the behavioral and administrative processes fundamental to the successful operation of various types of enterprise. Situational approaches to management are explored with the manager viewed as a decision maker interacting with the firm's economic, technological, social, political and ethical environment. Examination of research and theory in organizational behavior, organization theory and interpersonal communication. Case analysis is used to simulate actual problems encountered in organizations. *(Fall, Spring, Summer) (Evenings)*

MGMT 3160. Business Communications. (W) (3) Prerequisite: junior standing. The nature and problems of individual, interpersonal and organizational communication in business. Various verbal techniques such as presentations, graphics, public speaking and writing will be developed and practiced for effective organizational and individual performance. *(Fall, Spring, Summer) (Evenings)*

MGMT 3162. Business Interviewing Strategies. (W) (3) Prerequisite: junior standing. Examination of the interview process in a variety of specific management contexts including: career selection and assessment, goal-setting, problem solving, decision making, employment interviewing and performance appraisals. Case studies and simulations are used to analyze and address interviewing problems. *NOTE: This course may be taken as a general university elective; it does not satisfy a requirement for any concentration or major in the Belk College of Business Administration. (Fall)*

MGMT 3173. Being Your Own Boss: Small Business Management for Non-Business Majors. (3) Prerequisites: junior standing. A course for non-business majors who plan to be self-employed as professionals (engineers, psychologists, social workers, free-lance writers, nurses, etc.) or as owners of small enterprises such as theatre groups, art galleries, advertising agencies or similar groups or who plan to work for small family firms after graduation. Includes all aspects of starting, operating and selling a small firm. Emphasizes case studies and practical applications using materials actually needed to operate a real-world firm. Requires preparation of a simulated business plan for the firm the student hopes to start. Not available for credit for Belk College of Business Administration majors or students who receive credit for MGMT 3273. *(On demand)*

MGMT 3240. Leadership and Organizational Behavior. (3) Prerequisite: MGMT 3140. A managerial perspective of the influence of leadership, motivation, group dynamics, structure, communications, conflict and change on effective utilization and development of human resources emphasizing the role of a leader as a change agent. Case analysis, role playing and skills development exercises to simulate actual situations. *(Fall, Spring) (Evenings)*

MGMT 3241. Human Resource Management. (3) Prerequisite: MGMT 3140. The study of effectively selecting, utilizing, assessing and developing managers as well as the role of the human resource department in administering human resources in a changing and demanding environment. Experience in developing and utilizing behavioral science research methods to assess effectiveness. *(Fall, Spring) (Evenings)*

MGMT 3242. Compensation Administration. (3) Prerequisites: MGMT 3140 and 3241. Approaches to the design and management of compensation systems. Topics include the objectives of pay systems, policy decisions that provide the foundation for different pay systems, and the tools and techniques that link policies and objectives. *(Fall)*

MGMT 3243. Employment Law. (3) Prerequisite: MGMT 3140. This course examines the legislation which impacts human resource management practices in union and non-union settings. Topics covered include fair employment practices, anti-discrimination law, representation elections, unfair labor practices, compensation and benefit legislation, privacy concerns and dispute settlement processes. (Same as ECON 3107.) *(Fall, Spring) (Evenings)*

MGMT 3244. Advanced Human Resource Management. (3) Prerequisites: MGMT 3241; junior standing. Advanced topics in human resource management including strategic human resource planning, job analysis, human resource information systems, training, career development, and international human resource management. Case studies, projects and presentations are used to help students apply concepts and theories to current human resource issues. *(Spring)*

MGMT 3260. Managerial Communication. (3) Prerequisites: MGMT 3140, 3160, junior standing. An examination of the role of communication networks and strategies in managerial decision making. Emphasis on the role of communication skills in managing change, organizational conflict and corporate cultures. Cases will be used to apply the skills developed in MGMT 3140 and 3160 to analyze and address specific management problems. *(Spring)*

MGMT 3273. Small Business Management. (3) Prerequisites: OPER 3100, MKTG 3110, FINN 3120, MGMT 3140; junior standing. Consideration of opportunities and obstacles of starting and operating a small business. Emphasis will be on integrating all managerial requirements (financial, marketing, operation, legal, logistics, accounting and behavioral) of owning and operating a small business. Study of opportunities and assistance provided by franchises, federal, state and local agencies. Practice in solving problems gained through case analysis. *(Fall, Summer)*

MGMT 3274. International Business Processes and Problems. (3) Prerequisite: junior standing. An introduction to the process, institutions and problems associated with exporting, importing and management of multinational businesses. *(Fall)*

MGMT 3275. International Management. (3) Prerequisites: MGMT 3274 and senior standing. Preparation for effective management in a world characterized by intense international competition. Case studies, projects, and presentations assist students to apply concepts and theories. *(On demand)*

MGMT 3280. Business Policy. (3) Prerequisites: Senior standing and completion of ECON 3125, OPER 3100, MKTG 3110, FINN 3120, INFO 3130, BLAW 3150, MGMT 3140 and MGMT 3160. (Accounting majors are required to take OPER 3100, MKTG 3110, FINN 3120, INFO 3130, MGMT 3140, BLAW 3150, and either MGMT 3160 or COMM 1101.) Concerns the role of top management of the firm in integrating internal functions and environmental forces. Emphasis on defining economic, technological, ethical, political and social factors affecting the firm and their consideration in setting goals and operating policies. *(Fall, Spring, Summer) (Evenings)*

MGMT 3282. Business and Society. (3) Prerequisites: MKTG 3110, MGMT 3140, BLAW 3150. A study of the impact of management decisions on customers, employees, creditors, shareholders, community interests, ecology, and government (including taxes and the regulatory environment). The objective is to provide future managers with a systematic way of analyzing the impact of management decisions on larger society. *(Fall)*

MGMT 3283. Practicum in Small Business Planning. (3) Prerequisites: MGMT 3273; consent of Department chair. Designed for prospective small business owners pursuing the concentration in Small Business; others may be admitted on a space available basis. During the course, each student will work closely with a local small business owner to complete a plan designed to assist the owner in some phase of his/her firm. *(Spring)*

MGMT 3500. Cooperative Education Experience. (0) Enrollment in this course is required for the Department's cooperative education students during each semester they are working in a co-op position. This course is restricted to majors in the Department of Management. Course evaluation is Satisfactory/Unsatisfactory. *(Fall, Spring, Summer)*

MGMT 3800. Directed Study. (1-6) Prerequisites: consent of the Department and junior standing. Enrollment granted only by permission of the faculty with whom the work will be performed. The student's work assignments will be designed by the student and faculty member who will oversee the project of study. The credit hours will be determined prior to enrollment and will be based on the particular project undertaken. *(On demand)*

MARKETING (MKTG)

Undergraduate

MKTG 3000. Topics in Marketing. (3) Prerequisite: junior standing. Topics from the area of marketing. This course may be repeated for credit as topics vary. *(On demand)*

MKTG 3110. Marketing Concepts. (3) Prerequisites for marketing majors and minors: ACCT 2121, ECON 1202; junior standing. The marketing concept, aspects of marketing, and interface with the external environment and other functional areas of the organization. *(Fall, Spring, Summer) (Evenings)*

MKTG 3210. Marketing Research and Analysis. (3) Prerequisite: MKTG 3110. A research course which provides the student with an understanding of marketing research and its usefulness in the organization. Deals with scientific marketing research methods with emphasis on collection, analysis and interpretation of data as applied to the solution of marketing problems. *(Fall)*

MKTG 3211. Advertising Management. (3) Prerequisite: MKTG 3110. Covers all areas of marketing promotion, including such topics as advertising, media selection, packaging and forms of sales promotion. Offers basic skills and techniques to allow the student to enter careers in advertising or media. *(Fall)*

MKTG 3212. Retailing Management. (3) Prerequisite: MKTG 3110. Presents retailing as a part of the marketing distribution phase of a total interacting marketing system. Key concepts covered include consumer and market analysis, store location, store layout, merchandising, pricing and promotional issues and problems. Also considers legal and environmental implications. Emphasis on application of class concepts through case analysis and class discussion. *(Fall)*

MKTG 3213. Professional Selling and Sales Management. (3) Prerequisite: MKTG 3110. An overview of skills and knowledge involved in individual selling and management of sales programs. Emphasis on sales and sales management theories and their applications. *(Fall, Spring)*

MKTG 3215. Global Marketing Management. (X) (3) Prerequisites: MKTG 3110. Study of the marketing practices and analytical processes in international marketing operations, including strategic planning and organizing for international marketing, international pricing, promotion and distribution practices, and researching global markets. *(Fall, Spring)*

MKTG 3216. Consumer Behavior. (3) Prerequisite: MKTG 3110. Examination of the consumer decision-making process including searching for, purchasing, using, evaluating and disposing of products and services. Emphasis on how marketing mix, social-cultural factors, inner-characteristics and lifestyle affect consumer behavior. Discussion of current examples, cases and public policy issues. *(Fall, Spring)*

MKTG 3217. Logistics and Transportation. (3) Prerequisite: MKTG 3110. Examines logistics theory, concepts, and practices as applied to the business organization. Elements of the logistics system (e.g. inventory, warehousing, materials handling, packaging, and transportation) are considered singly and as parts of a larger, interactive system. The transportation function will be singled out for a more in-depth study. Emphasis is on relationships and interfaces which must be recognized in the design and management of logistics systems. *(Fall, Spring)*

MKTG 3218. Export Marketing and Logistics. (3) Prerequisite: MKTG 3110. Study of exporting strategies and practices, including identification of export markets, development of distribution channels, and exporting logistics, documentation, and financing. Examination of U.S. international trade patterns and trends. *(On demand)*

MKTG 3219. Marketing Strategy. (3) Prerequisites: MKTG 3110 and senior standing. Integration of all

marketing elements in a strategic planning framework. Emphasis on areas of strategic importance, especially those which have significant implications and relevance for marketing policy decisions in competitive situations. (*Spring*)

MKTG 3500. Cooperative Education Experience. (0) Enrollment in this course is required for the Department's cooperative education students during each semester they are working in a co-op position. This course is restricted to majors in the Department of Marketing. Course evaluation is Satisfactory/Unsatisfactory. (*Spring, Summer, Fall*)

MKTG 3800. Directed Study. (1-6) Prerequisites: consent of the Department and junior standing. Enrollment granted only by permission of the faculty with whom the work will be performed. The student's work assignments will be designed by the student and faculty member who will oversee the project of study. The credit hours will be determined prior to enrollment and will be based on the particular project undertaken. (*On demand*)

PUBLIC ADMINISTRATION (MPAD)

Graduate Only

MPAD 6000. Topics for Graduate Study in Public Administration. (1-4G) Intensive study of a topic in public administration. The topic of investigation may vary from semester to semester. May be repeated for credit. *(On demand) (Evening)*

MPAD 6102. Legal and Institutional Foundations of Public Administration. (3G) Consideration of the political context of contemporary public administration, with attention to the role of administration in the policy process, the legal basis for public administration, legislative-executive relations, and accountability and responsibility in democratic administration. *(Fall, Spring) (Evenings)*

MPAD 6104. Theoretical and Ethical Foundations of Public Administration. (3G) Changing images of people, organizations and organizational environments; research findings and applications related to organization structure, motivation, leadership, communications, decision-making, group dynamics, interpersonal skills; ethics and values important to the study and practice of organizational leadership; and assessment of value systems and the impact of competing value systems on public and organizational policy making. (*Fall, Spring) (Evenings*)

MPAD 6125. Quantitative Research Methods in Public Administration. (3G) Corequisite: MPAD 6125L. Introduction to the use of quantitative analysis in administration. Special emphasis on issues of research design, data collection, elementary statistical analysis, and the interpretation and presentation of research findings. *(Fall, Spring) (Evenings)*

MPAD 6125L. Computer Laboratory In Quantitative Research Methods in Public Administration. (1G) Corequisite: MPAD 6125. Hands-on computer experience to master the substantive materials taught in Quantitative Research Methods. *(Fall, Spring) (Evenings)*

MPAD 6128. Public Policy Analysis and Program Evaluation. (3G) Analysis of the policy making process with particular attention to the role of public administration. Development and application of policy analysis methods, methods of evaluation, research design and measurement, and methods to incorporate program evaluation with planning, budgeting and personnel management. *(Fall, Spring) (Evenings)*

MPAD 6131. Public Budgeting and Finance. (3G) An introduction to the basics of public finance and an examination of the theory and development of public budgeting, budget processes, the budget cycle, capital budgets, revenue sources, taxation policies and processes, intergovernmental fiscal relations and governmental accounting practices, debt management and cash management in public organizations. *(Spring) (Evenings)*

MPAD 6134. Human Resources Management. (3G) Examination of human resource management, including compensation, benefits, personnel planning, recruitment, selection, training and development, employee appraisal and discipline, union management relations and quality management. (Same as HADM 6147). *(Fall, Spring) (Evenings)*

MPAD 6140. Labor Management Relations in Government. (3G) Public employee unionization, collective bargaining, unit determination and recognition; negotiation; third-party process; administration of agreements. *(On demand) (Evenings)*

MPAD 6141. Conflict Management in Public Organizations. (3G) The role of the administrator as a focal point in social change and the management of the conflict which occurs. Perspectives on the negotiation and bargaining process will be reviewed. *(On demand) (Evenings)*

MPAD 6142. Managing Grants and Contracts in the Public and Nonprofit Sectors. (3G) Understanding government contracting and practice in government and nonprofit grant proposal writing with the development of contract administration skills. (*On demand) (Evenings*)

MPAD 6144. Changing the Public Organization. (3G) Overview of concepts and methodologies of organization development, diagnosing organizational needs, change strategies and interventions. (*On demand) (Evenings)*

MPAD 6146. Introduction to Urban Administration. (3G) An introduction to the basic literature of urban administration and consideration of theoretical questions of administration as an independent field of study and practice, particularly as applied to an urban setting. (*On demand) (Evenings*)

MPAD 6160. Information Systems in Public Administration. (3G) A discussion of the nature of information systems in urban administration. Particular attention to developing understanding of administrative control and use of technology, and the processes, policies and issues associated with public information systems. *(On demand) (Evenings)*

MPAD 6172. Introduction to the U.S. Health Care System. (3G) Overview of health care in the United States, including organizational structures, financing mechanisms and delivery systems with particular attention to policy formation and development. (Same as HADM 6112.) *(Yearly) (Evenings)*

MPAD 6174. Public Policy and Politics in Health Care Administration. (3G) Examination of the formulation, adoption and implementation of public policy for health care through federal, state and local political processes. Same as HADM 6127) *(On demand) (Evenings)*

MPAD 6176. Trends and Issues in Health Administration. (3G) Examination of current issues confronting health care managers and an assessment of current programs and management responses to emerging trends in the health care field, including delivery systems, marketing/competition, strategic planning, financial management and/or epidemiological changes. (Same as HADM 6133) *(On demand) (Evenings)*

MPAD 6185. Intergovernmental Relations. (3G) Survey of the complex relationships of governments in an urban environment set in the federal system. A review of the problems created by that system and the approaches to their solutions. *(On demand) (Evenings)*

MPAD 6187. Advanced Seminar in Public Management Problem Solving. (3G) Prerequisite: consent of MPA program. Seminar viewed as a capstone to the student's coursework in public management and is required to be taken by all students. Seminar devoted to topics in public management which involve problem identification and solution. *(Fall, Spring) (Evenings)*

MPAD 6188. Research Applications in Public Administration. (3G) Prerequisite: consent of MPA program. Preparation of a major paper on a topic of significance in public or nonprofit administration. Topics must be approved by the instructor, and paper drafts will be revised by the student following evaluation by the instructor. *(Fall, Spring)*

MPAD 6210: Aging and Public Policy. (3G) Examination of the public policy making process with attention to aging policy, including determinants of aging policy and institutions and actors in the policy making process. (Same as GRNT 6210) *(Yearly) (Evenings)*

MPAD 6211: Administration of Aging Programs. (3G) Focus will be the implementation of public policies and programs for the aged and the development and administration of these programs, including the process through which policies are transformed into aging programs and the budgetary, management and evaluative considerations that must be taken into consideration. (Same as GRNT 6211) *(Yearly) (Evenings)*

MPAD 6800. Directed Study in Public Administration. (3G) Prerequisite: all core courses and passing of comprehensive examination and consent of MPA program. Individual project proposal on a directed topic of significance based on field experience in public administration. *Pass/In Progress* grading. *(Fall, Spring) (Evenings)*

MPAD 6801. Directed Study in Public Administration. (3G) Prerequisite: MPAD 6800 and consent of MPA program. Individual project report on a directed topic of significance based on field experience in public administration. *Pass/In Progress* grading. *(Fall, Spring) (Evenings)*

MPAD 7999. Graduate Residence. (0G) Prerequisite: MPAD 6801. Continuation of the individual project report on a directed topic of significance based on field experience in public administration. *(Fall, Spring) (Evenings)*

MILITARY SCIENCE (MSCI)

Undergraduate

MSCI 1101. Basic Course I. (1) Introduction to ROTC and the U.S. Army including the rationale of the national defense structure and the mission and role of the Army. Introduction to modern theories of leadership and their application to today's environment. *(Fall, Spring)*

MSCI 1102. Basic Leadership Laboratory I. (1) Practical work in basic military skills and physical ability development. Introduction to land navigation, drill and ceremony, communications, and the Army's standard individual weapons with emphasis upon team work and confidence building through participation in leadership activities. Two laboratory hours per week. *(Spring)*

MSCI 2101. Basic Course II. (2) Introduction to map reading techniques, small unit tactics and the role of the junior officer in troop leading. First aid in a tactical environment will be surveyed. *(Fall, Spring)*

MSCI 2102. Basic Leadership Laboratory II. (1) Emphasis upon developing proficiency in basic military skills with students assuming leadership roles when the class functions as a military unit. Assertive, confident leadership through knowledge and practice will be stressed. Two laboratory hours per week. *(Spring)*

MSCI 3101. Advanced Course I. (3) Prerequisite: Basic Course or consent of the professor of military science. Introduction to the advanced ROTC area and an examination of branches of the Army, military teaching principles, management and small unit tactics, including refresher and advanced training in communications, drill and ceremonies, land navigation and physical fitness. Students must be successfully pursuing a commission in the Regular Army, Army Reserve or Army National Guard. *(Fall)*

MSCI 3102. Advanced Course II. (3) Prerequisite: MSCI 3101. Designed specifically to prepare cadets for attendance at advanced camp with emphasis on mastering skills necessary to operate and maintain military equipment and developing self-confidence. *(Spring)*

MSCI 3103. Advanced Leadership Laboratory I. (1) Prerequisite: MSCI 3101. Practical application and additional development of military skills and leadership

principles with emphasis on mastery of all previous military skills with much of the training being performance oriented. Students develop their leadership by rotating through various leadership positions during the conduct of their training. Two laboratory hours per week. (*Spring*)

MSCI 3201. Advanced Course III. (3) Prerequisite: MSCI 3102. Examination of staff organization procedures and purpose including a detailed analysis of the total Army concept (Regular Army, Army Reserve, National Guard). Practical application of military briefing techniques and examination of the relationship of the Army officer and society through a survey of military history. (*Fall*)

MSCI 3203. Advanced Leadership Laboratory II. (1) Prerequisite: MSCI 3201. Extensive practical work in military planning and instructional techniques and special emphasis upon development of applied leadership skills necessary as a commissioned officer. Two laboratory hours per week. (*Spring*)

MUSEUM STUDIES (MSTS)

Undergraduate

MSTS 2101. Introduction to Museum Studies. (3) Survey of the museum profession; types, philosophies, functions and goals of museums; and responsibilities to the profession and to educating the public and scholarly communities. (*Fall*)

MSTS 3090. Topics in Museum Studies. (1-3) Prerequisite: MSTS 2101, 3101, 3102, or consent of instructor. Examination of specialized topics in museum studies. May be repeated for credit as topics vary. (*On demand*)

MSTS 3101. Curation and Collections. (3) Prerequisite: MSTS 2101. Types of collections, storage, records, policies, conservation, liabilities and legal issues; uses of collections. (*Spring*)

MSTS 3102. Research and Documentation. (3) Prerequisite: MSTS 2101. Research in the museum; interdisciplinary research methodologies, documentation of collections, exhibit planning and preparation, publications documenting collections. Students will be required to develop a research project in conjunction with some aspect of museum work. (*On demand*)

MSTS 3201. Museum Education. (3) Prerequisite: MSTS 2101. Museums as educational institutions; interpretation of collections for exhibitions and how to develop educational programs for museums. (*Fall*)

MSTS 3202. Museum Administration. (3) Prerequisite: MSTS 2101. Survey of museum organization and administration; ethics and policies, governing authorities, relationship to public, ethics, legal and financial matters, including budget planning and grant applications. (*On demand*)

MSTS 3203. Exhibition Design. (3) Prerequisites: MSTS 2101 (for Museum Studies Minors), or ARTS 2181 (for Art Majors). Theory, interpretation, design and fabrication of exhibitions for museums, galleries, and other cultural, corporate, educational and public use. Six hours. (Same as ARTS 3287) (*Spring*) (*Alternate years*)

MSTS 3480. Internship in Museum Studies. (1-3) Prerequisite: MSTS 2101, at least six hours of Museum Studies core courses beyond 2101 and consent of Program Coordinator. Research and/or in-service training in area museums. Content of each internship will be based upon a contractual agreement between the student, Program Coordinator and museum. Amount of credit to be determined by the nature and extent of the internship assignment. May be repeated for credit up to a maximum of six semester hours. (*Fall, Spring, Summer*)

MSTS 3601. Senior Internship or Project. (3-6) Prerequisite: senior standing, MSTS 2101 and Museum Studies core courses. Senior project or internship in any of the subareas of the museum field relevant to the major discipline and specific interests of the student or a synthesis of prior work. (*Fall, Spring, Summer*)

MSTS 3895. Directed Individual Studies. (1-4) Prerequisite: MSTS 2101 and consent of Program Coordinator. Supervised investigation of problems and areas in the museum profession of special interest to the student. May be repeated for credit. (*Fall, Spring, Summer*)

MUSIC (MUSC)

Undergraduate

MUSC 0971. Orchestra. (1) A performing ensemble. May be repeated for credit. Three contact hours. (*Fall, Spring*)

MUSC 0972. Jazz Ensemble. (1) Prerequisite: consent of instructor. A performing ensemble. May be repeated for credit. Three contact hours. (*Fall, Spring*)

MUSC 0973. Concert Band. (1) A performing ensemble. May be repeated for credit. Three contact hours. (*Fall, Spring*)

MUSC 0974. Guitar Ensemble. (1) Prerequisite: consent of instructor. A performing ensemble. May be repeated for credit. Three contact hours. (*Fall, Spring*)

MUSC 0982. University Chorale. (1) A performing ensemble. May be repeated for credit. Three contact hours. (*Fall, Spring*)

MUSC 0983. Madrigal Ensemble. (1) Prerequisite: audition. A performing ensemble. May be repeated for credit. Three contact hours. (*On demand*)

MUSC 1100. Rudiments of Music. (3) Introductory skill-building course in music reading. (*On demand*)

MUSC 1132. Music Appreciation. (A) (3) Aural approach to musical comprehension. (*Fall, Spring, Summer*)

MUSC 1133. The History of Rock Music. (3) A chronological approach to the evolution of rock music, its varied styles and artists. (*Fall, Summer*)

MUSC 1134. The Evolution of Jazz. (3) A chronological approach to the history of jazz, its main styles and artists. (*Spring*)

MUSC 1221. Classroom Instruments. (1) Playing and teaching techniques and materials for rhythm instruments, autoharp, guitar, and mallet (Orff) instruments. *(Fall)*

MUSC 1223. Woodwind Techniques, Methods, and Materials 1. (1) Playing and teaching techniques and materials for flute, oboe, clarinet, bassoon, and saxophone. *(Fall)*

MUSC 1224. Woodwind Techniques, Methods and Materials II. (1) Continuation of MUSC 1223. (Spring)

MUSC 1225. Brass Techniques, Methods and Materials 1. (1) Playing and teaching techniques and materials for trumpet, horn, trombone, euphonium, and tuba. *(Fall)*

MUSC 1226. Brass Techniques, Methods, and Materials II. (1) Continuation of MUSC 1225. *(Spring)*

MUSC 1227. String Techniques, Methods and Materials 1. (1) Playing and teaching techniques and materials for violin, viola, cello, and bass. Two contact hours. *(Fall)*

MUSC 1228. String Techniques, Methods and Materials II. (1) Continuation of MUSC 1227. *(Spring)*

MUSC 1229. Percussion Techniques, Methods and Materials. (1) Playing and teaching techniques and materials for snare drum, timpani, mallet percussion, and accessory instruments. *(Spring)*

MUSC 1230. Musical Structure and Style 1. (2) Prerequisite: consent of instructor. Study of music fundamentals through simple tonality and 4-part writing. Three contact hours. (*Fall*)

MUSC 1231. Musical Structure and Style II. (2) Prerequisite: consent of instructor. A continuation of MUSC 1230. Further study of tonal relations, including secondary dominants and modulation. Three contact hours. (*Spring*)

MUSC 1233. Class Piano 1. (1) Prerequisite: departmental permission. Class instruction in piano. Three contact hours. (*Fall*)

MUSC 1234. Class Piano II. (1) Prerequisite: departmental permission. A continuation of MUSC 1233. Three contact hours. (*Spring*)

MUSC 1237. Class Voice. (1) Class instruction in voice. Three contact hours. May be repeated for credit. (*Fall, Spring*)

MUSC 1238. Guitar Class 1. (2) Prerequisite: consent of instructor. Class instruction in guitar using contemporary popular music and music from a text. Three contact hours. (*On demand*)

MUSC 1239. Guitar Class II. (2) Prerequisite: consent of instructor. Continuation of MUSC 1238. Three contact hours. (*On demand*)

MUSC 1241-1259. Applied Music courses consist of private instruction, one-half hour instruction per week, per credit hour. Minimum of one hour practice per day for one credit, two hours for two credits. May be repeated for credit.

MUSC 1241. Applied Music: Trumpet. (1-2) Prerequisite: consent of instructor. (*Fall, Spring*)

MUSC 1242. Applied Music: French Horn. (1-2) Prerequisite: consent of instructor. (*Fall, Spring*)

MUSC 1243. Applied Music: Trombone. (1-2) Prerequisite: consent of instructor. (*Fall, Spring*)

MUSC 1244. Applied Music: Tuba. (1-2) Prerequisite: consent of instructor. (*Fall, Spring*)

MUSC 1245. Applied Music: Guitar. (1-2) Prerequisite: consent of instructor. (*Fall, Spring*)

MUSC 1246. Applied Music: Harp. (1-2) Prerequisite: consent of instructor. (*Fall, Spring*)

MUSC 1247. Applied Music: Organ. (1-2) Prerequisite: consent of instructor. (*Fall, Spring*)

MUSC 1248. Applied Music: Piano. (1-2) Prerequisite: consent of instructor. (*Fall, Spring*)

MUSC 1249. Applied Music: Violin. (1-2) Prerequisite: consent of instructor. (*Fall, Spring*)

MUSC 1250. Applied Music: Viola. (1-2) Prerequisite: consent of instructor. (*Fall, Spring*)

MUSC 1251. Applied Music: Cello. (1-2) Prerequisite: consent of instructor. (*Fall, Spring*)

MUSC 1252. Applied Music: Bass. (1-2) Prerequisite: consent of instructor. (*Fall, Spring*)

MUSC 1253. Applied Music: Voice. (1-2) Prerequisite: consent of instructor. (*Fall, Spring*)

MUSC 1254. Applied Music: Flute. (1-2) Prerequisite: consent of instructor. (*Fall, Spring*)

MUSC 1255. Applied Music: Clarinet. (1-2) Prerequisite: consent of instructor. (*Fall, Spring*)

MUSC 1256. Applied Music: Saxophone. (1-2) Prerequisite: consent of instructor. (*Fall, Spring*)

MUSC 1257. Applied Music: Oboe. (1-2) Prerequisite: consent of instructor. (*Fall, Spring*)

MUSC 1258. Applied Music: Bassoon. (1-2) Prerequisite: consent of instructor. (*Fall, Spring*)

MUSC 1259. Applied Music: Percussion. (1-2) Prerequisite: consent of instructor. (*Fall, Spring*)

MUSC 1260. Ear Training 1. (1) Prerequisite: consent of instructor. The development of aural skills through sight

singing, melodic, rhythmic and harmonic dictation. Three contact hours. (*Fall*)

MUSC 1261. Ear Training II. (1) Prerequisite: consent of instructor. Continuation of Ear Training I. Three contact hours. (*Spring*)

MUSC 2137. Phonetics and Articulation for Singers I. (2) Prerequisite: consent of instructor. Pronunciation and articulation in vocal music in English, Italian, German and French. Three contact hours. (*Fall*)

MUSC 2138. Phonetics and Articulation for Singers II. (2) Prerequisites: MUSC 2137 and consent of instructor. Three contact hours. (*Spring*)

MUSC 2191. Musicianship. (3) Student will develop basic music skills through elemental media. (For non-majors only) (*Fall, Spring*)

MUSC 2192. Elementary Music Methods. (2) Prerequisite: consent of instructor. Methods and materials for teaching music to elementary school children. (*Fall*)

MUSC 2193. Secondary Music Methods. (2) Methods and materials for teaching music to junior and senior high school students. (*On demand*)

MUSC 2194. Elementary Instrumental Methods. (2) Prerequisite: consent of instructor. Study and analysis through individual evaluation and in-class group performance of current elementary instrumental method books and teaching strategies. Field work required. Three contact hours. (Fall)

MUSC 2195. Secondary Instrumental Methods. (2) Prerequisite: consent of instructor. Musical, organizational, and administrative aspects of teaching junior and senior high school bands and orchestras. Field work required. Three contact hours. (Spring)

MUSC 2230. Musical Structure and Style III. (2) Prerequisite: consent of instructor. A continuation of MUSC 1231. Further study in tonal relations, including borrowed chords, neapolitan and augmented sixth chords. Three contact hours. (*Fall*)

MUSC 2231. Musical Structure and Style IV. (2) Prerequisite: consent of instructor. A continuation of MUSC 2230. Study of late 19th and early 20th century chromaticism, including impressionism--may include a study of some formal designs. Three contact hours. (*Spring*)

MUSC 2233. Class Piano III. (1) Prerequisite: departmental permission. Continuation of Class Piano II. Three contact hours. (*Fall*)

MUSC 2234. Class Piano IV. (1) Prerequisite: departmental permission. Continuation of Class Piano III. Two contact hours. (*Spring*)

MUSC 2235. Jazz Improvisation I. (2) Prerequisite: consent of instructor. An introduction to major, minor diminished, augmented, 7th, 9th, 11th, and 13th chords and to their usage within the confines of a piece of music with particular attention to the melodic line. (*Fall*)

MUSC 2236. Jazz Improvisation II. (2) Prerequisite: consent of instructor. An expansion of MUSC 2235, with particular attention to refinement and maturity of the melodic line. (*Spring*)

MUSC 2237. Counterpoint. (2) Prerequisite: consent of instructor. Counterpoint beginning with 16th century techniques. (*Spring*)

MUSC 2260. Ear Training III. (1) Prerequisite: consent of instructor. Continuation of Ear Training II. Three contact hours. (*Fall*)

MUSC 2261. Ear Training IV. (1) Prerequisite: consent of instructor. Continuation of Ear Training III. Three contact hours. (*Spring*)

MUSC 3001. Topics in Music. (1-6) Prerequisite: consent of instructor. Special topic in music. May be repeated for credit. (*On demand*)

MUSC 3134. Fundamentals of Conducting. (2) Conducting techniques for instrumental and choral ensembles. Three contact hours. *(Fall)*

MUSC 3135. Choral Conducting. (2) Prerequisite: MUSC 3134. Developing conducting skills for interpreting choral music. *(Spring)*

MUSC 3136. Instrumental Conducting. (2) Prerequisite: MUSC 3134. Developing conducting skills for interpreting instrumental music. (*Spring*)

MUSC 3137. Vocal Pedagogy. (2) Prerequisite: two semesters of MUSC 1253 or permission of instructor. A methodology course dealing with technique, vocal problem/solution and physiology, and voice production. (*Spring*)

MUSC 3139. Orchestration. (3) Prerequisite: MUSC 2231. Scoring and arranging for instruments and/or voice. (*On demand*)

MUSC 3140. Secondary Choral Methods. (2) Rehearsal techniques, repertoire, and administration of junior and senior high school choral groups. Includes mixed concert choirs, male and female choirs, and techniques for show/jazz choir. Field work required. Three contact hours. *(Spring)*

MUSC 3141. Music Teaching Methods and Learning Theory. (2) Prerequisite: consent of instructor. Study and application in the elementary school music class of the music teaching/movement methods and philosophies of Orff, Dalcroze, Laban, Gordon, and Kodaly. Field work required. Three contact hours.

MUSC 3145. Arranging for the Music Educator. (1) Prerequisite: departmental permission. Techniques used to arrange music for instrumental and vocal ensembles from existing sources. Three contact hours. *(Fall)*

MUSC 3150. Accompanying. (1) Prerequisite: consent of instructor. Accompanying techniques for pianists. Required accompanying of solos by other student musicians. One contact hour. *(Fall, Spring)*

MUSC 3151. Keyboard Skills for the Music Educator. (1) Prerequisite: consent of instructor. Development of the ability to play instrumental and vocal scores of varying difficulty at the piano. One contact hour. *(Fall)*

MUSC 3170. Music History I. (A) (3) Prerequisite: consent of instructor. Music history and literature from the Medieval Period through the Classical era. *(Fall)*

MUSC 3171. Music History II. (W) (3) Prerequisite: consent of instructor. Music history and literature from the Romantic Era to the present. *(Spring)*

MUSC 3230. Musical Structure and Style V. (3) Prerequisite: consent of instructor. Continuation of MUSC 2231. Study of 20th century music, including Neoclassicism, Post-serialism, Minimalism, and Neoromanticism. *(Fall)*

MUSC 3231. Musical Structure and Style VI. (3) Prerequisite: consent of instructor. Study of larger musical structures such as symphony, concerto, contrapuntal designs, and 20th century approaches to form and analysis. *(Spring)*

MUSC 3281. Chamber Music Ensembles. (1) Prerequisite: consent of instructor. Performance by small groups of specific works. *(Fall, Spring)*

MUSC 3283. Opera Workshop. (2) Prerequisite: audition. Performance of scenes, acts, and entire operas. May be repeated for credit. Three contact hours. *(Fall, Spring)*

MUSC 3467. Student Teaching/Seminar: K-12 Fine and Performing Arts: Music (15) Prerequisite: approved application for student teaching; senior status; completion of professional education requirements; grades of *C* or better in all courses required for licensure. Corequisite: enrollment only in student teaching. A planned sequence of experiences in the student's area of specialization conducted in an approved school setting under the supervision and coordination of a university supervisor and a cooperating teacher in which the student demonstrates the competencies identified for his/her specific teaching field in an appropriate grade level setting. *(Spring)*

MUSC 3831. Composition. (2) Prerequisite: consent of instructor. Private instruction. May be repeated for credit. One contact hour. *(Fall, Spring)*

NURSING (NURS) (NUAH) (NUAN) (NUMH) (NUNA) (NUNP) (NUPC) (NURN)

Undergraduate

NURS 1100. Growth and Development. (3) (Open to non-nursing majors.) Study of the developing person through the life span. Consideration of the meaning of health and illness to the individual, the family, and the community within the context of life as a continuing, dynamic process from conception through death. *(Fall, Spring)*

NURN 3100. Professional Nursing Perspective (3) Prerequisite: admission to RN/BSN option. Concepts of professional nursing with exploration of ethical, legal, sociocultural, political, and economic factors interacting with the individual nurse, the nursing profession, and society. Examination of nursing process and critical thinking as the basis for professional nursing.*(Spring)*

NURS 3101. Concepts and Skills for Professional Nursing. (5) Prerequisites: Admission to the major. Concepts, skills and attitudes fundamental to professional nursing practice within a framework for clinical decision-making. Nurse-client relationship viewed from a holistic perspective with emphasis on the client's adaptive responses in health and illness. Various clinical practice settings are utilized. *(Fall)*

NURS 3103. Pharmacology in Health and Illness. (3) Prerequisites: BIOL 1274. Prerequisite or corequisite: BIOL 1259, or permission of instructor. Presentation of theoretical base for the safe and therapeutic use of drugs. Examination of pharmacologic agents commonly used in health and illness and the standards and societal controls of drugs. Three class hours weekly. *(Fall)*

NURS 3104. Nutrition in Health and Illness. (3) Prerequisites: CHEM 1252 or 1204 or permission of instructor. Nutrition in health and illness viewed from a life cycle perspective. Exploration of therapeutic and cultural aspects of nutrition. (Open to non-nursing majors.) *(Fall)*

NURS 3113. Health Assessment. (3) Prerequisites: BIOL 1274, NURS 1100, or permission of instructor. Corequisite: NURS 3101 or permission of instructor. Competencies necessary for holistic health assessment across the lifespan. Evaluation of human function using interview, nursing observation, and physical examination data within a framework for clinical decision-making. *(Fall)*

NURS 3114. The Nursing Profession. (2) Evolution of professional nursing including examination of ethical, legal, and other social models that impact on the profession. (Open to non-nursing majors.) *(Fall)*

NURS 3115. Health and the Aging Process. (3) Examination of the physiological processes of aging as a normal life experience. Study of psychological, nutritional and general health issues designed to facilitate high-level wellness. *(Same as GRNT 3100)(Spring)*

NURS 3200. Research and Theoretical Foundations of Nursing. (3) Prerequisites: NURS 3101, 3114. Exploration of the theoretical foundations of nursing with emphasis on research, theories, concepts and processes leading to their application in practice. *(Spring)*

NURS 3201. Nursing Care of the Childbearing Family. (6) Prerequisites: Level I courses. Corequisite: NURS 3200. Development of competencies for the nursing care management of childbearing families with emphasis on the nurse's role in health assessment, health promotion, and promotion of adaptive processes for childbearing families. Sociocultural, economic, political and ethical factors that impact on health promotion, disease prevention, and risk reduction for the childbearing family are examined. Selected settings are utilized for clinical practice. *(Fall, Spring)*

NURS 3202. Nursing Care of Children. (6) Prerequisites: Level I courses. Corequisite: NURS 3200. Development

of competencies for the nursing care management of children experiencing potential and actual alteration in health with emphasis on the nurse's role in health assessment, health promotion, and promotion of adaptive processes for the child within the context of the family. Selected settings are utilized for clinical practice. *(Fall, Spring)*

NURS 3203 Nursing Care of the Adult I. (6) Prerequisites: Level I courses. Corequisite: NURS 3200. Development of selected competencies for nursing care management of adult clients with predictable human responses to specific system alterations. Risk reduction, recovery and rehabilitation of clients with selected diseaseprocesses are addressed within the ethic of caring. Selected settings are utilized for clinical practice. *(Fall, Spring)*

NURS 3251. Advanced Professional Roles and Issues. (3) Prerequisite: Level II courses. Exploration of societal and professional trends and issues affecting nursing and health care. Leadership strategies within the profession and practice of nursing. Principles and implementation strategies of health care management within organizational systems. *(Spring)*

NURS 3252. Community Health Nursing. (WX) (6) Prerequisites: Level II courses. Development of competencies for the nursing care management of culturally diverse individuals, families, and populations within communities with emphasis on the nurse's role in health promotion and maintenance. Particular focus on risk identification and reduction throughout the life span. Multiple community-based agencies are utilized. *(Fall, Spring)*

NURS 3253. Nursing Care of the Adult II. (6) Prerequisites: Level II courses. Focus on selected competencies for designing comprehensive nursing care management of adult clients with complex and unpredictable human responses to specific system alterations. Selected settings are utilized for clinical practice. *(Fall, Spring)*

NURS 3254. Mental Health Nursing. (6) Prerequisites: Level II courses. Development of competencies necessary for the practice of mental health nursing with emphasis on the use of self in relationships with clients and health team members. The nurse-client relationship provides the framework for exploring the factors impacting the behavior of clients. Selected settings are utilized for clinical practice. *(Fall, Spring)*

NURN 3400. Professional Nurse Practicum/Seminar. (5) Prerequisite: NURS 3100, 3113 or permission of the instructor. Clinical practicum incorporating theory-based practice in a variety of health care settings with clients who have multiple health care needs. Emphasis on clinical judgment and decision-making, diagnostic reasoning, clinical ethics, collaboration, and case management. Examination of nursing therapeutics within the structure of nursing process and nursing diagnosis. *(Fall)*

NURN 3401. Professional Nursing Seminar. (3) Prerequisites: NURN 3100 and 3400. Development of interventions for health promotion, risk reduction, restoration of health and rehabilitation for individuals, families and groups with multiple health needs. Emphasis on critical analysis of selected case studies. *(Spring)*

NURS 3895. Independent Study in Nursing. (1-4) Prerequisite: permission of the instructor. Directed individual study in a selected aspect of nursing which is explored in greater depth than included in the planned curriculum. May be repeated for additional credit as focus of the study varies. No more than six hours in NURS 3895 and/or 4090 may be counted toward degree requirements. *(On demand)*

Undergraduate/Available for Graduate Credit

Additional work required for graduate credit.

NURS 4090. Topics in Nursing. (1-3) (1-3G) Prerequisite: permission of the instructor. Critical examination of selected current topics in nursing. *(Fall, Spring)*

NURS 4191. Women's Health Issues. (3) (3G) Prerequisite: WMST 1101 or permission of the instructor. Exploration of contemporary issues in women's health from the feminist and women's health movement perspectives. (Same as WMST 4191.) *(Fall)*

Graduate and Advanced Undergraduate

NURS 5090. Selected Topics in Nursing. (3) (3G) Prerequisite: permission of instructor. Topics to be chosen from the specialties of nursing. May be repeated for credit as topics vary. No more than six hours of topics and/or independent study course credit in nursing may be applied toward degree requirements. *(Fall, Spring)*

NURS 5170. Computer Applications in Nursing. (3) (3G) A study of the use of computers in the field of nursing. Emphasis is placed upon analysis and application of computer systems in nursing administration, nursing education, and nursing research. *(Yearly)*

Graduate Only

NUCI 6100. Chronic Illness Concepts and Theories for Advanced Nursing Practice. (2G) Pre- or co-requisite: NURS 6101 and 6160. Contemporary chronic illness concepts and theories relevant to individuals and families coping with long-term health deviations and their impact on society with emphasis on knowledge and skills for advanced nursing practice. *(Fall)*

NURS 6101. Theoretical Basis for Nursing Practice. (3G) Philosophical foundations and knowledge development in nursing. Evaluation of theories, models, and their relationships to practice. *(Fall, Spring)*

NURS 6110. Perspectives in Nursing. (2G) Analysis of the societal forces, issues and trends having an impact on nursing and health care, including a critical examination of strategies which accelerate or impede the change process. *(On demand)*

NURS 6115. Health Policy and Planning in the U.S. (3G) Overview of health care delivery system in the United States. Analysis of health care policy, financing, political

trends, ethical, and professional issues, including the theoretical underpinning of policy making, the empirical thrusts of policy analysis and research, and the relationship between policy making and the political process. *(Fall, Spring)*

NUAH 6120. Adult Health Nursing I. (4G) Prerequisites: BIOL 6050 or equivalent; physical assessment course. Examination of scientific data relevant to adult health and illness with emphasis on the utilization of multidisciplinary theory in the assessment and implementation of nursing practice. Autonomous nurse behavior in response to health-illness events is stressed. *(Spring)*

NUAH 6125. Adult Health Nursing II. (4G) Prerequisite: NURS 6120. Continuation of NURS 6120. *(Fall)*

NUMH 6130. Advanced Psychiatric Mental Health Nursing Practice with Individuals. (4G) Prerequisite: NUMH 6200. Corequisite: PSYC 6015. Examination and application of the therapeutic process of advanced psychiatric mental health nursing with emphasis on application of theories from psychiatric, behavioral, cultural sciences, and nursing in selected clinical experiences. Clinical seminar, clinical conference, clinical experience, and faculty/peer supervision provide opportunities for development of the roles of the advanced psychiatric mental health nurse in a managed care or traditional health care environment as an individual therapist. *(Spring)*

NUMH 6135. Advanced Psychiatric Mental Health Nursing Practice with Groups and Communities. (4G) Prerequisite: NUMH 6130. Corequisite: NUCN 6201. Examination and application of the therapeutic process of advanced psychiatric mental health nursing with emphasis on groups and communities. Clinical seminar, clinical experience and supervision provide opportunities for development of the roles of the nurse in a managed care and traditional health care environment as a group therapist and promotion of mental health in community settings. *(Fall)*

NUPC 6140. Parent and Child Health Nursing I. (4G) Prerequisites: BIOL 6050 or equivalent; physical assessment course. Assessment and management of clients of childbearing and childrearing families focusing on the theoretical concepts in parenting, family development, nurturing and human sexuality with emphasis on the development and behavior of children as biopsychosocial beings in the context of the illness-wellness continuum. *(Spring)*

NUPC 6145. Parent and Child Health Nursing II. (4G) Prerequisite: NURS 6140. Continuation of NURS 6140 with focus on acute, complex care problems of children or pregnant women and their families. *(Fall)*

NUAN 6151. Principles of Nurse Anesthesia I. (3G) Prerequisite: NURS 6156. Overview of the principles, techniques and equipment necessary for the administration of anesthesia for the general surgical client. *(Spring)*

NUAN 6152. Principles of Anesthesia II. (3G) Prerequisite: NURS 6151. Specific techniques of nurse anesthesia practice for selected clients. *(Summer)*

NUAN 6153. Principles of Anesthesia III. (3G) Prerequisite: NURS 6152. Advanced nurse anesthesia practice for selected clients. *(Fall)*

NUAN 6154. Pharmacology in Nurse Anesthesia I. (4G) Prerequisite: Consent of the Department. Introduction to the pharmacology of anesthetic drugs and adjunctive agents, including general pharmacological principles, pharmacokinetics and pharmacodynamics. *(Fall)*

NUAN 6155. Pharmacology in Nurse Anesthesia II. (4G) Prerequisite: NURS 6154. Continuation of Pharmacology I with emphasis on the clinical use of anesthetic agents and adjunctive drugs. *(Spring)*

NUAN 6156. Applied Physics and Chemistry in Nurse Anesthesia. (3G) Prerequisite: Consent of the Department. Basic laws and principles of physics, inorganic chemistry, and organic chemistry as they apply to the clinical practice of nurse anesthesia. *(Fall)*

NUAN 6157. Applied Pathophysiology in Nurse Anesthesia I. (3G) Prerequisite: BIOL 6050. Pathophysiology of the nervous and cardiovascular systems with emphasis on their anesthetic implications. *(Spring)*

NUAN 6158. Applied Pathophysiology in Nurse Anesthesia II. (3G) Prerequisite: NURS 6157. Pathophysiology of the respiratory, endocrine, excretory and renal systems with emphasis on their anesthetic implications. *(Summer)*

NUAN 6159. Professional Aspects of Nurse Anesthesia. (1G) Prerequisite: NUAN 6153. Overview of the legal aspects regarding the practice of nurse anesthesia and information about the American Association of Nurse Anesthetists, including its history and the Councils on Accreditation, Licensure and Practice. *(Spring)*

NURS 6160. Research in Nursing and the Health Professions. (3G) Prerequisites: Nursing majors: NURS 6101; Health Education majors; HLED 6143. Application of inquiry methods to problems in nursing and the health professions. *(Fall, Spring)*

NUNA 6170. Organization and Administration in Nursing Services. (3G) Prerequisites: NURS 6101 and MBAD 6161 or permission of instructor. Provides a knowledge base from which to conceptualize, investigate and understand complex organizations and management processes with emphasis on nursing as a major component of the health care delivery system. *(Fall)*

NUNA 6171. Nursing Management of Resources in Health Care Organizations. (3G) Prerequisites: NURS 6101 and 6170 or permission of instructor. Examination of critical nursing management issues associated with human, fiscal and material resources in a variety of health care settings. Study of nurse staffing, utilization, patient acuity and quality assurance components conducive to the professional practice of nursing using a systems approach emphasizing hospital information management. *(Spring)*

NUNA 6172. Financial Nursing Management in Health Care Organizations. (3G) Prerequisites or corequisite: NURS 6171 or permission of instructor. Concepts of financial management in health care organizations as context for the planning and control of the nursing budget. Strategies for successful budget presentation, defense and negotiation. *(Fall)*

NURS 6175. Nursing Informatics. (3G) Adaptation of technological innovation (Informatics) to the field of nursing, including theoretical and applied computer utilization. Emphasis on learning to use new nursing technologies and to build upon their present patient care capabilities. *(Spring) (Evening)*

NURS 6176. Nursing Data (3G) Prerequisite: NURS 6175. Data-information - knowledge continuum in nursing and its application to practice, emphasizing identification, systemization and use of nursing data for decision support and expert judgment. *(Fall) (Evenings)*

NUMH 6200. Psychiatric Mental Health Theories and Constructs of Mental Health Care. (3G) Prerequisite or Corequisite: NURS 6101. Examination of theoretical frameworks underlying the practice of advanced psychiatric mental health nursing. Integration of biological, psychological, sociological, and nursing theories into the student's individual theoretical framework for practice. *(Fall)*

NUCN 6201. Advanced Nursing Care in the Community. (3G) Pre-or corequisite: Epidemiology. Advanced nursing in the community emphasizing community assessment, needs assessment, cultural diversity, community organization and dynamics, change theory, motivation theory, community focused change and issues related to community based nursing. *(Spring)*

NUCN 6202. Organization and Delivery of Health Care in Urban and Rural Environments. (3G) Prerequisite: NUCN 6201. Working with communities to plan, implement and evaluate health programs in urban and rural settings, including use of focus, advisory and community action groups. *(Fall)*

NUCN 6203. Primary Prevention with High Risk Populations. (3G) Prerequisite: NUCN 6201. Risk assessment and the implementation and evaluation of primary prevention services to populations at risk, including prevention strategies and the effects of social and political influences on program development. *(Spring)*

NURS 6210. The Family and Health: Concepts, Theories, and Research (3G) Prerequisite or corequisite: NURS 6101. Family as the basic unit of care and analysis of the cultural context of families. Theories, concepts, and research for the comprehensive assessment and management of family health throughout the family life cycle. *(Spring)*

NURS 6220. Pharmacotherapeutics in Advanced Nursing Practice (3G) Prerequisite or corequisite: BIOL 6050 Advanced Human Physiology. Principles of pharmacology and drug therapy for advanced nursing practice, including legal and social considerations related to prescriptive authority and prescribing patterns. Satisfies NC Board of Nursing requirements for nurse practitioner. *(Spring)*

NUNP 6230. Health Assessment and Diagnostic Reasoning for Advanced Nursing Practice (3G) Prerequisite or corequisite: NURS 6101 and BIOL 6050 Advanced Human Physiology. Knowledge and skills for advanced physical and psychosocial health assessment of adults and children. Advanced health evaluation techniques, laboratory tests, diagnostic studies and interpretation and documentation of findings. Includes two credit hours of didactic and one credit hour of clinical practice (60 clinical hours). *(Fall)*

NUNP 6240. Advanced Primary Care of Women (5G) Prerequisite: NURS 6220 and 6230. Prerequisite or corequisite: NURS 6210. Role of the family nurse practitioner in the primary care of women and preparation for advanced clinical decision making related to common health concerns of women. Concepts of health promotion, health maintenance, and cultural and environmental variations are integrated throughout the course. Includes three credit hours of didactic and two credit hours of clinical practice (120 clinical hours). *(Spring)*

NUNP 6250. Advanced Primary Care of Adults (5G) Prerequisites: NURS 6220, 6230, and 6210. Role of the family nurse practitioner in the primary care of adult family members and preparation for advanced clinical decision making related to adults with common health problems, including acute episodic illness and stable chronic disease. Concepts of health promotion, health maintenance, and cultural and environmental variations are integrated throughout the course. Includes 3 credit hours of didactic and two credit hours of clinical practice (120 clinical hours). *(Fall)*

NUNP 6260. Advanced Primary Care of Children and Adolescents (5G) Prerequisites: NURS 6220 and 6230. Prerequisite or corequisite: NURS 6210. Role of the family nurse practitioner in the primary care of children and adolescents and preparation for advanced clinical decision making related to children and adolescents with common health problems including acute episodic illness and stable chronic disease. Concepts of health promotion, health and cultural and environmental variations are integrated throughout the course. Includes 3 credit hours of didactic and 2 credit hours of clinical practice (120 hours). *(Spring)*

NUNP 6400. Internship in Family Health Nursing (4G) Prerequisite: NUNP 6240, 6250, and 6260. Role of the family nurse practitioner in the assessment and management of the health of individuals and families across the lifespan. Implementation of clinical decision making skills in family health promotion and management of acute episodic and stable chronic conditions and consideration of professional practice issues. Includes one credit hour of seminar/case presentation and three credit hours of clinical practice (180 clinical hours). *(Summer)*

NUCI 6401. Healthy Lifestyles and Chronic Illness Care. (3G) Pre- or co-requisite: NUCI 6100. Role of the advanced practice nurse in promoting health life-styles to prevent or minimize the effects of chronic illness. Students

will incorporate critical thinking and diagnostic reasoning in assessing, diagnosing, monitoring, coordinating, managing and communicating health care findings of adults and their families. (45 clinical hours) *(Fall)*

NUMH 6401. Internship in Advanced Psychiatric Mental Health Nursing Practice. (4G) Prerequisite: NUMH 6135. Corequisite: NURS 6115. Role of the advanced practice psychiatric mental health nurse in the assessment and management of individuals, groups, and communities; application of clinical decision making skills in individual and group psychotherapy and in a community mental health setting; examination of professional practice issues. Seminar/case presentation and 120 hours of clinical practice. *(Spring)*

NUCI 6402. Acute Care of Chronically Ill Adults. (4G) Pre- or co-requisite: NURS 6101 and 6160. Care of adults who have acute episodes of illness and require hospitalization. Emphasis on alterations in oxygenation, metabolism, mobility, and immunity experienced by acutely ill adults. (90 clinical hours) *(Spring)*

NUCI 6403. Advanced Practice Nursing in Chronic Care. (4G) Pre- or co-requisite: NURS 6101 and 6160, NUCI 6100. Managed care of chronically and terminally ill clients and their families with emphasis on the role of the advanced practice nurse in helping them manage the effects of chronic illness, including rehabilitation. (90 clinical hours) *(Fall)*

NUCN 6405. Community Health Nursing Practicum I. (3G) Prerequisite: NUCN 6201; pre- or corequisite: NUCN 6202. Assessment of health need in a specific urban or rural public health setting in the metropolitan area, including identification of intervention choices and community resources and development and implementation of action and evaluation plans with emphasis on program financing. Ten hours of practice per week and a two hour weekly seminar. *(Fall)*

NUCN 6406. Community Health Nursing Practicum II. (3G) Prerequisite: NUCN 6205, pre- or corequisite NUCN 6203. Identification of high risk populations in the metropolitan area and intervention choices and community resources to serve them, including development and implementation of action and evaluation plans. Ten hours of practice in the community per week and a two hour weekly seminar. *(Spring)*

NURS 6480. Teaching Practicum. (3G) Prerequisites: completion of two related courses and advanced clinical courses. Individualized teaching experience with a faculty preceptor in both clinical and classroom settings, emphasizing application of teaching strategies, theories of learning, and principles of evaluation. *(Spring)*

NURS 6482. Management Practicum. (3G) Prerequisites: completion of NURS 6170, 6171 or 6172 and advanced clinical courses. Guided management practicum with individuals and groups functioning in middle management roles in nursing services. Emphasis is placed on conceptual, human and technical skills in management. *(Spring)*

NURS 6484. Clinical Specialist Practicum. (3G) Prerequisites: completion of two related courses and advanced clinical courses. Guided seminar and practicum focusing upon the role of the clinical specialist in the management of patient care. Emphasis is placed upon the use of theory, as well as political, organizational and professional processes in role development. *(Spring)*

NUAN 6485. Clinical Residency in Nurse Anesthesia I. (7G) Prerequisites: NUAN 6153. Clinical application of didactic material from the nurse anesthesia curriculum through beginning level practice in the role of a nurse anesthetist. Conferences during the clinical residency provide opportunities to review current research and practice issues. *Pass/Unsatisfactory* grading only. *(Fall)*

NUAN 6486. Clinical Residency in Nurse Anesthesia II. (7G) Prerequisite: NUAN 6485. Continuation of the clinical application of didactic material from the nurse anesthesia curriculum with focus on utilization of additional anesthesia techniques and increased skill development. *Pass/Unsatisfactory* grading only. *(Spring)*

NUAN 6487. Clinical Residency in Nurse Anesthesia III. (4G) Prerequisite: NUAN 6486. Incorporation of the content of the nurse anesthesia curriculum with opportunities to begin synthesis of all didactic material and techniques for efficient clinical practice. *(Summer)*

NUNA 6488. Advanced Administration Practicum. (5G) Prerequisite: completion of all other required courses. The capstone course of the specialization area in Nursing Administration. Students demonstrate theory and practice in the field under the guidance of selected administrative preceptors. *(Fall, Spring)*

NUAN 6489. Clinical Residency in Nurse Anesthesia IV. (0G) Prerequisite: NUAN 6487. Non-credit clinical residency for synthesis of all didactic material and techniques of nurse anesthesia clinical practice, promotion of professional practice, and preparation of the student for the licensure examination. *(Fall)*

NURS 6661. Research Seminar. (2G) Prerequisite: NURS 6160 and graduate statistics course. Application of inquiry methods to nursing problems including systematic observation and critical analysis of research methods. Submission of a written research or project proposal is required. *(On demand)*

NURS 6895. Independent Study. (1-2-3G) Guided individual study in topics or issues related to nursing arranged with a faculty adviser. May be repeated for credit. No more than six hours of topics and/or independent study courses may be counted toward degree requirements. *(Fall, Spring)*

NURS 6962. Thesis. (1-2-3G) Prerequisite: NURS 6160. Production of a piece of nursing research or investigation of a problem relevant to nursing which demonstrates contribution to professional knowledge through systematic investigation and participation in the process of peer reviewed research. *(Fall, Spring)*

NURS 7999. Graduate Residence. (OG) Prerequisite: Consent of thesis adviser. Required of all graduate studies working on a thesis who are not enrolled in other graduate courses. *(Fall, Spring)*

OPERATIONS MANAGEMENT (OPER)

Undergraduate

OPER 3000. Topics in Operations Management. (3) Prerequisite: OPER 3100. Topics from the areas of Operations Management. The course may be repeated for credit. (*On demand*)

OPER 3100. Operations Management. (3) Prerequisites: MATH 1120, STAT 1220, ACCT 2121, 2122; ECON 2101, 2102; INFO 2130; junior standing. Introduction to and development of the management functions in manufacturing and non-manufacturing organizations. A systems approach to the organizational environment, the basic operating functions, the problems and decisions a manager encounters and solution techniques and models. Computer application are included where appropriate. (*Fall, Spring, Summer) (Evenings*)

OPER 3200. Quantitative Analysis in Business. (3) Quantitative business research methods, information sources, and introduction to management decision making. Either OPER 3200 or a satisfactory performance on a proficiency examination on its content must be fulfilled by all MBA students as part of the preparatory component. (Cannot be taken for credit toward any undergraduate degree within the Belk College of Business Administration.) (Formerly MBAD 6100.) *(Fall, Spring)*

OPER 3201. Advanced Operations Management. (3) Prerequisite: OPER 3100. Cases and/or management simulations enable the student to apply the knowledge attained in Operations Management. The student, through an application forum, should develop in greater depth his/her understanding of the operating functions of an organization. (*Fall*)

OPER 3203. Management Science. (3) Prerequisite: OPER 3100. Analytical approach to understanding the management process and solving management problems with emphasis on existing models and developing insights for problem development and model building. (*Spring*)

OPER 3204. Management of Service Operations. (3) Prerequisites: OPER 3100. Solving problems and directing employees in service organizations. Topics include location, design, layout, queuing, capacity, scheduling, routing, change, management and quality control. (*On demand*)

OPER 3206. Managing for Quality. (3) Prerequisites: OPER 3100. A study of management philosophy, practices and analytical processes implemented in quality planning and administration of products and services. Topics include corporate culture, quality design, human factors and motivation, quality cost analyses and auditing, service quality, quality assurance, quality circles, and conformance to design. (*Fall*)

OPER 3500. Cooperative Education Experience. (0) Prerequisite: major in Management Information Systems or Operations Management. Enrollment in this course is required for the department's cooperative education students during each semester they are working in a co-op position. Course evaluation is Satisfactory/Unsatisfactory. (*Fall, Spring, Summer*)

OPER 3800. Directed Study. (1-6) Prerequisites: consent of the Department and junior standing. Enrollment granted only by permission of the faculty with whom the work will be performed. The student's work assignments will be designed by the student and faculty member who will oversee the project of study. The credit hours will be determined prior to enrollment and will be based on the particular project undertaken. (*On demand*)

OPERATIONS RESEARCH (OPRS)

All OPRS/MATH/STAT courses offered by the Department of Mathematics are approved to satisfy requirements for the Problem Solving Goal of UNC Charlotte Education.

Undergraduate

OPRS 2111. Introduction to Operations Research. (3) Prerequisite: MATH 1120 or 1241 and CSCI 1100 or 1201 and its lab. Modeling and graph theory with applications to linear programming, critical path analysis, transportation and allocation problems, and queuing theory. (May not be taken for credit if credit for OPRS 3111 has been given.) *(On demand)*

OPRS 3111. Operations Research: Deterministic Models. (3) Prerequisites: MATH 1242 and 2164. Linear, integer and dynamic programming, the simplex method, networks, PERT and CPM techniques, game theory, and applications. *(On demand)*

OPRS 3113. Operations Research: Probabilistic Models. (3) Prerequisite: MATH 1242, 2164, and MATH/STAT 2121 or STAT 2122 or MATH/STAT 3122, or consent of the department. Queueing models, inventory models, simulation, markov chains, decision analysis, game theory and probabilistic dynamic programming. *(On demand)*

Undergraduate/Available for Graduate Credit

OPRS 4010. Topics in Decision Mathematics. (2-3) (2-3G) Prerequisite: consent of the department. Topics in decision mathematics selected to supplement regular course offerings in this area of mathematics. May be repeated for additional credit with the approval of the department. Credit for the M.A. degree in mathematics requires approval of the department. (*On demand*)

OPRS 4113. Game Theory. (3) (3G) Prerequisites: OPRS 3111 and one of STAT 2122, MATH/STAT 3122, or OPRS 3113. The theory of zero-sum matrix games, mini-max theorem, optimal strategies, symmetric games, economic models, infinite, separable, polynomial, multi-stage, general-sum and n-person games. A project will be required of all graduate students. (*On demand*)

OPRS 4114. Dynamic Programming. (3) (3G) Prerequisites: CSCI 1100 or 1201 and its lab, OPRS 3111, and one of STAT 2122, MATH/STAT 3122 or OPRS 3113. The identification of dynamic programming problems and their solution in terms of recurrence relations.

Elementary path problems, resource allocation, shortest path, traveling salesmen problem, discrete-time optimal control, replacement models and inventory systems. A project will be required of all graduate students. *(On demand)*

Graduate and Advanced Undergraduate

OPRS 5111. Linear Programming. (3) (3G) Prerequisite: OPRS 3111 and CSCI 1100 or 1201 and 1201L. Mathematical formulation and solution of linear programming problems. Topics include: the simplex method and its variations, sensitivity and parametric analysis, duality, and applications. A project will be required for all graduate students. *(On demand)*

OPRS 5112. Non-Linear Programming. (3) (3G) Prerequisites: CSCI 1100 or 1201 and 1201L, OPRS 3111 and MATH 2141. Basic unconstrained optimization problems, search techniques, some discussion of rates of convergence and an introduction to constrained optimization. Computer implementation and testing of optimization algorithms will be required. A project will be required of all graduate students. *(On demand)*

Graduate Only

OPRS 6101. Introduction to Operations Research. (3G) Prerequisite: STAT 3122. Operations Research approach: modeling, constraints, objective and criterion. The problem of multiple criteria, optimization, model validation. The team approach. Systems design. Examples, or methodology: mathematical programming, optimum seeking, simulation, gaming, heuristic programming. Examples, or applications: theory of inventory, economic ordering under deterministic and stochastic demand. The production smoothing problem, linear and quadratic cost functions. Waiting line problems: single and multiple servers with Poisson input and output. The theory of games for two-person competitive situations. Project management through probabilistic activity networks and deterministic activity network (CPM-PERT). *(Fall)*

OPRS 7125. Stochastic Processes. (3G) Same as MATH 7125.

PHYSICAL EDUCATION (PHED)

Undergraduate

PHED 1099. Topics in Games/Exercise/Sports. (1) Specialized topics or innovations in games, exercise and sports. May be repeated for credit as topics vary. (On demand)

PHED 1201. Foundations of Physical Conditioning. (1) The application and basic science of physical training programs designed to improve and maintain physical fitness. *(Fall, Spring)*

PHED 1202. Weight Training. (1) Mechanics and programming of weight training. *(Fall, Spring, Summer)*

PHED 1203. Fencing. (1) The skills and rules of the sport of fencing. *(Spring)*

PHED 1204. Aerobic Fitness. (1) Exercise designed to develop and maintain physical fitness through aerobic activity to music. *(Fall, Spring)*

PHED 1206. Adaptive and Developmental Physical Education. (1) Prerequisite: permission of the instructor. Prescribed ameliorative exercises adapted to individual needs, capacities and interests. Designed for the individual with anatomical and functional defects. *(Fall, Spring)*

PHED 1208. Walk, Jog, Run. (1) Application of exercise science and art principles to the safety and effectiveness of walking, jogging and running as models for improving and maintaining cardiovascular health and physical fitness. *(Fall, Spring)*

PHED 1209. Step Aerobics. (1) Physical fitness training emphasizing aerobic conditioning via variations and combinations of step patterns performed on adjustable exercise benches and the safety and benefits of low impact movements. *(Fall, Spring)*

PHED 1210. Beginning Swimming. (1) For weak swimmers or nonswimmers. Instruction in water safety fundamentals, basic body positioning, maneuvering in water, and traveling skills, including basic strokes. *(Fall, Spring)*

PHED 1211. Intermediate Swimming. (1) Emphasis on gaining competency in at least four basic strokes and increasing endurance. *(Fall, Spring)*

PHED 1215. Aquatic Fitness. (1) Application of exercise science and art principles to the safety and effectiveness of aquatic exercise as a mode for improving and maintaining general health and physical fitness. *(Fall, Spring)*

PHED 1220. Beginning Tennis. (1) The rules, basic skills and strategy. *(Fall)*

PHED 1222. Racquet Sports. (1) Basic skills, tactics, safety and rules of racquetball, court and table tennis, squash and badminton. *(Fall, Spring)*

PHED 1223. Beginning Badminton. (1) The rules, basic skills and strategy. *(Fall)*

PHED 1231. Introduction to Outdoor Adventure. (1) Prerequisites: Successful completion of water safety test and consent of instructor. Introduction to outdoor education through participation in Venture Weekend Workshops, class discussions and written reflection. Six classroom sessions and 5 days of trips individually selected from Venture's offerings for the semester. Special fee assessed for the Venture weekend workshops. *(Yearly)*

PHED 1232. Orienteering. (1) Introduction of off trail navigation with emphasis in the use of topographic maps, compasses, and route finding for wilderness travel; and the sport of competitive orienteering. Weekly class and 1 or 2 Saturday meets. *(Spring) (Alternate years)*

PHED 1233. Rock Climbing. (1) Introduction to rock climbing with emphasis on belaying and safety systems, climbing techniques, and the metaphorical and psychological aspects of climbing. Six classroom sessions and two weekend trips. *(Alternate years)*

PHED 1234. Canoeing. (1) Prerequisite: Successful completion of water safety test. Introduction to canoeing on

flat water and white water emphasizing basic strokes, river reading, and boating safety. 10 classroom sessions and 2 weekend days. *(Spring)*

PHED 1235. Adventure Activities. (1) Introduction to personal challenge/discovery activities including group initiatives, trust exercises, high ropes activities involving physical and psychological risk and challenge, and adventure games and cooperative games (New Games). Development of competencies to facilitate adventure activities for groups. *(Yearly)*

PHED 1240. Beginning Golf. (1) The grip, stance, stroke, use and selection of clubs, rules and etiquette. *(Fall, Spring)*

PHED 1242. Archery. (1) The fundamental skills and selection, care and repair of equipment. *(Fall)*

PHED1250. Volleyball. (1) The rules, fundamental skills and strategies. *(Fall, Spring)*

PHED 1262. Recreational Dance. (1) Social and partner dancing in a recreational setting. Basic knowledge of dance steps, dance music, style, leading/following techniques, plus current popular variations. *(Fall, Spring)*

PHED 1263. Body Shaping. (1) Selected methods of resistive exercises used to shape, tone and define musculature. Symmetry, body alignment and flexibility, augmented by the use of hand-held weights, bands, benches, and partners in a gymnasium setting. *(Alternate semesters)*

PHED 2212. Lifeguarding. (2) The knowledge and skills associated with lifeguarding. Qualifying students will receive the American Red Cross Lifeguarding Certificate. *(Spring)*

PHED 2213. Water Safety Instruction. (3) Prerequisite: current American Red Cross Advanced Lifesaving Licensure. Techniques used in teaching people aquatic skills. Qualifying students will receive the American Red Cross Water Safety Instructor's rating. *(Spring)*

PHED 2219. Scuba Diving. (2) Corequisite: PHED 2219L. The science associated with the use of self-contained underwater breathing apparatus. Students who demonstrate the required knowledge and skills may request licensure as an open water SCUBA diver. *(Fall, Spring, Summer)*

PHED 2219L. Scuba Diving Laboratory. (1) Corequisite: PHED 2219. Prerequisite: appropriate swimming ability to current scuba standards as prescribed by recognized scuba certifying organizations. The skills associated with the use of self-contained underwater breathing apparatus. *(Fall, Spring, Summer)*

PHED 2220. Advanced Scuba Diving. (1) Prerequisite: Certified Open Water Diver or licensure as a Basic SCUBA Diver with a minimum of 10 logged dives. The knowledge and skill required for underwater navigation, search and recovery, limited visibility diving and deep diving. The student will be required to go on two weekend-long open water dives. Advanced Open Water Diver Licensure will be granted to students who qualify. *(Fall, Spring)*

PHED 2230. Wilderness Experience. (3) An introduction to wilderness pursuits with a focus on high level wellness, environmental appreciation and group dynamics. Backpacking and skills to conduct trips; introduction to personal challenge through high adventure activities. Field experiences during class and two weekend trips. *(Fall)*

PHED 2251. Introduction to Human Movement: A Personal Approach. (3) Selected methods of observing and analyzing human movement via self-observation and study. *(Fall)*

PHED 2280. Foundations of Exercise Science. (3) Prerequisite: BIOL 2273, 2273L, 2274 and 2274L. Physiological foundations of programming exercise for health fitness with emphasis on acute physiological responses to bouts of exercise and chronic physiological responses and adaptations to repeated exercise and programs of exercise. *(Spring)*

PHED 2290. General Safety and First Aid Procedures. (3) Issues associated with safety management, identification and evaluation of trauma situations to support implementation of effective emergency procedures. American Red Cross Standard First Aid and Cardiopulmonary Resuscitation licensure requirements may be met. *(Fall, Spring, Summer)*

PHED 2294. Basic Athletic Training. (3) Prerequisites: PHED 2290 or consent of the instructor. Foundations of athletic training and sports injury causes, response and management, and application to specific sports. *(On demand)*

PHED 3099. Movement Problems/Topics. (1-6) Prerequisite: consent of instructor. Movement problems/topics chosen by the student which relate to special areas of interest. May be repeated for credit with approval of instructor. *(Fall, Spring, Summer)*

PHED 3200. Special Physical Education for the Mentally Handicapped Child. (3) Prerequisite: admission to teacher education program. Study of movement potentials and limitations of mentally handicapped children and teaching skills necessary to use movement as a medium for physical, social and emotional development. *(On demand)*

PHED 3228. Integrating Physical Activity and Movement Into Elementary Schools. (2) Prerequisites: Junior or senior status, EDUC 2100, 3120, and SPED 2100. Movement and physical activity for elementary school children. *(Fall, Spring)*

PHED 3233. Movement Experiences for Elementary School Children. (3) Prerequisites: EDUC 2100, 2110 and 2150. Study of movement and physical activities as applied in the elementary school program. *(Fall, Spring, Summer)*

PHED 3251. Human Movement. (3) Prerequisite: PHED 2251 or permission of instructor. Analysis and application of basic movement in specific sport, dance, gymnastic and aquatic skills. *(Spring)*

PHED 3285. Conditioning for Maximum Sports Performance. (3) Prerequisite: PHED 2290 or consent of instructor. A study of biomechanical and physiological

principles of conditioning for maximum sports performance. Two lecture and three laboratory hours. (*On demand*)

PHED 3286. Exercise Evaluation and Conditioning for Health Fitness. (3) Prerequisite or corequisite: PHED 2280. Methods and protocols for collecting data, interpretation of the data and using data to develop individual and group conditioning programs. *(Spring)*

PHED 3286L. Methods and Protocols Laboratory. (1) Corequisite: PHED 3286. Practitioner lab in the use of appropriate data collection methods and protocols. (Spring)

PHED 3290. Advanced Athletic Training I. (3) Prerequisites: BIOL 2273, 2273L, 2274 and 2274L; PHED 2290 and 2294. Study of regions of the body relative to potential for sports injury and the evaluation and management of conditions specific to each. (*On demand*)

PHED 3291. Advanced Athletic Training II. (3) Prerequisite: PHED 3290. Theories and techniques of therapeutic modalities and physical rehabilitation within the scope of athletic training. (*On demand)*

PHED 3292. Advanced Athletic Training III. (3) Prerequisite: PHED 3290. Athletic training organization, administration, and practice as a senior intern. (*On demand*)

PHED 3293. Biomechanics. (3) Prerequisites: BIOL 1273, 1273L, 1274 and 1274L. Mechanical and anatomical kinesiology as it relates to human movement with emphasis on anatomical structures, mechanics, and common injuries involved with selected sport movements. (Fall) Requires preparation of a paper on a comparative biomechanical analysis of a sport movement. *(Fall)*

PHED 3293L. Biomechanics Lab. (1) Prerequisite or corequisite: PHED 3293. Laboratory experiences and assignments to enhance the lecture material presented in PHED 3293. One laboratory period of two hours a week. (Fall)

Undergraduate/Available for Graduate Credit

Additional work required for graduate credit.

PHED 4204. Perceptual Motor Development. (3) (3G) Theories, principles and research related to perceptual-motor development of children. (*On demand*)

PHED 4205. Perceptual Motor Learning. (3) (3G) Prerequisite or corequisite: PHED 4204 or consent of instructor. Perceptual-motor learning of children and its effect on school performance and the relationships of perceptual-motor development to reading, writing and mathematics. (*On demand*)

PHED 4208. Perceptual Motor Therapy. (3) (3G) Prerequisite: PHED 4205 or consent of the instructor. Observation of and evaluation and therapy for children with perceptual-motor delays. (*On demand*)

PHED 4210. Perceptual Motor Therapy Laboratory. (1) (1G) Prerequisites/corequisite: PHED 4204 or 4205 or 4208. (*Fall, Spring)*

PHED 4211. Perceptual Motor Therapy Laboratory. (2) (2G) Prerequisites/corequisite: PHED 4204 or 4208. (*Fall, Spring)*

PHED 4212. Perceptual Motor Therapy Laboratory. (3) (3G) Prerequisite/corequisite: PHED 4204 or 4205 or 4208. Supervised observation, testing and clinical teaching of children with perceptual-motor dysfunction. Course may be repeated for credit with approval of instructor. (*Fall, Spring)*

PHILOSOPHY (PHIL)

Undergraduate

PHIL 1105. Critical Thinking. (3) Fundamental skills of clear thinking and critical assessment of typical messages by and between persons in everyday situations. Application of logical methods to advertisements, editorials, political speeches and textbooks to distinguish effective from ineffective forms of reasoning. (*Fall, Spring, Summer*)

PHIL 2101. Introduction to Philosophy. (L) (3) Basic concepts and problems of philosophy such as freedom and determinism, mind-body interaction, the status of moral judgments, and the nature of knowledge. Readings from the works of representative philosophers both classical and contemporary. (*Fall, Spring, Summer) (Evenings*)

PHIL 2105. Deductive Logic. (P) (3) Principles of deductive logic, both classical and symbolic, with emphasis on the use of formal logic in analysis or ordinary language discourse. (*Fall, Spring, Summer) (Evenings*)

PHIL 2175. Professional Ethics. (3) (V) Basic concepts, principles and cases in ethics for the professions, including a reasoning model for ethical decisions, basic principles and codes of professional ethics, and actual case scenarios from the professions. *(Yearly)*

Prerequisites for upper-level courses. While PHIL 2101 is not a prerequisite for courses at the 3000 level and above, students who have taken PHIL 2101 typically benefit more from upper-level philosophy courses than students who have not.

PHIL 3050. Topics. (3) Prerequisite: consent of the department. Topics chosen from specific areas in philosophy such as freedom and determinism, imagination, detailed study of significant philosophical movements or works. May be repeated for additional credit with the approval of the department. (*On demand*)

PHIL 3060. Major Figure in Philosophy. (3) Prerequisite: consent of the department. An investigation into the thoughts and writings of a major figure in philosophy with special emphasis on primary sources. Included may be Plato, Aristotle, Descartes, Kant, Heidegger, and others as indicated by departmental needs and interests. May be repeated for additional credit. (*On demand*)

PHIL 3201. Meaning of Death. (3) Death in the western tradition. Philosophical, religious, existential, psychological and literary readings clarifying conceptual problems in our ways of speaking about death. Understanding death as a horizon for understanding life. (Same as RELS 3201.) *(On demand)*

PHIL 3205. Philosophy In and Of Literature. (A) (3) Relationship between philosophy and literature with special emphasis on the nature of literature as it presents concepts and evaluations. Readings will be in the theory of literature as well as in contemporary novels, plays and short stories for both their philosophical and their aesthetic properties. *(On demand)*

PHIL 3211. Ancient Philosophy. (3) Western intellectual and philosophic thought from the early Greeks to the post-Aristotelian period. Readings from the pre-Socratics, Plato, Aristotle, Epicureans, Stoics, Skeptics and Neoplatonists. *(Fall)*

PHIL 3212. Medieval Philosophy. (3) Western philosophical tradition from Augustine to William of Ockham. Readings include such other authors as Anselm of Canterbury, Bonaventure, Thomas Aquinas and Duns Scotus. *(On demand)*

PHIL 3213. Modern Philosophy from Descartes to Kant. (3) Modern philosophic and scientific thought. Readings selected from representative works in the 17th to the 19th centuries. *(Spring)*

PHIL 3214. Contemporary Philosophy. (3) Main problems of contemporary philosophy; pragmatism, logical positivism, linguistic analysis, existentialism. *(On demand)*

PHIL 3217. American Philosophy. (3) European philosophic movements with counterparts in American thought, leading to distinctly American pragmatism, realism and humanism. Readings from 19th- and 20th-century philosophers. *(On demand)*

PHIL 3221. Ethics. (V) (3) A study of the nature and foundations of moral judgment, the principles and criteria for sound moral decisions, and the application of these to contemporary moral issues. Discussion includes such specific problems as: abortion, capital punishment, privacy, war, and sexual morality. *(On demand)*

PHIL 3223. Existentialism. (A) (3) Existentialist tradition in philosophy and literature including such issues as: authenticity, absurdity and the meaning of life, freedom and morality, anguish, death, and atheism. *(On demand)*

PHIL 3225. Aesthetics. (A) (3) Major theories of art, including readings from Aristotle, Kant, Nietzsche, Collingwood, Dewey, Langer and Beardsley. Emphasis on expression, criticism, the work of art, and the creative process. *(Fall, Spring)*

PHIL 3226. Social and Political Philosophy. (C) (3) Philosophical concepts involved in understanding and evaluating the basic structure of societies (e.g., economic, educational, legal, motivational and political) including equality, fraternity, freedom and rights. Relevance to contemporary social and political issues stressed. Readings from classical and contemporary sources. Same as POLS 3177. Taught by Philosophy Department. *(On demand)*

PHIL 3227. Feminist Philosophy. (3) Views of contemporary feminist and female philosophers on traditional philosophical issues such as ethics, human nature, the construction of knowledge, modes of social and political organization, the relationship between the mind and the body, and the nature of God. (Same as WMST 3247.) *(Alternate years)*

PHIL 3228. Biomedical Ethics. (V) (3) Major ethical dilemmas within the life sciences examined to assist students to identify, analyze, and decide ethical issues in such a way that they can defend their positions to themselves and others. Issues include abortion, death and dying, patient rights, and justice in the allocation of medical resources. *(Yearly)*

PHIL 3231. Business Ethics. (V) (3) Ethical problems confronting business as a social institution and individuals in business. Application of ethical theory to business institutions and practices, internal exchanges of business (e.g., hiring, promotions, working conditions, employer/employee rights and duties) and external exchanges (e.g., product safety, environment, depletion, marketing, advertising.) *(Spring)*

PHIL 3235. Advanced Logic. (3) Advanced systems of logic, with emphasis upon symbolic logic and formal systematic characteristics such as axiomatics and proof techniques. *(On demand)*

PHIL 3242. Philosophy of Religion. (3) Philosophical implications of religious experience including the definitions, development and diverse forms of the problems of belief and reason in modern thought. (Same as RELS 3242.) *(On demand)*

PHIL 3245. Philosophy of Mind. (3) Conceptual issues in the mind/body problem and the problem of other minds. Analysis of concepts of intention, motivation, consciousness, imagination and emotion. *(On demand)*

PHIL 3247. Philosophy of Science. (3) Epistemological, methodological, metaphysical, interdisciplinary and meta-disciplinary issues arising out of science with "science" construed very broadly to imply a strong connection with all systematic inquiry, either past or present, into natural or social questions. *(On demand)*

PHIL 3265. Theory of Knowledge. (3) A study of various theories on the nature, foundations and limits of knowledge. Analysis of the notions of knowledge and belief, evidence and the sources of knowledge. Discussion of the principles and criteria for distinguishing knowledge from opinion or belief. Readings from both classical and contemporary sources. *(On demand)*

PHIL 3275. Metaphysics. (3) Inquiry into the most fundamental and comprehensive structures and categories of reality, especially in relation to persons as knowers and agents. Discussion of such topics as: being, existence and

truth; substance, essence and accident; universals and individuals; mind, soul, matter and god. *(On demand)*

PHIL 3791. Honors Thesis I. (2) Prerequisite: consent of the department. Individual or group inquiry into selected philosophic problems. Exposition and discussion of the results. *(Fall, Spring)*

PHIL 3792. Honors Thesis II. (2) Prerequisite: consent of the department. A continuation of PHIL 3791 focused on preparation and presentation of an honors thesis. *(Fall, Spring)*

PHIL 3851. Practicum in Philosophy. (1-3) Prerequisite: consent of the department. Directed individual study involving the student and instructor in rethinking and reworking some major problems in the teaching of undergraduate philosophy including interaction with a particular class, usually PHIL 1105, 2101 or 2105, in the preparation, presentation and evaluation of the course. (Not for teacher licensure.) *(On demand)*

PHIL 3859. Independent Study. (1-3) Prerequisite: consent of the department. Directed individual study of a philosophical issue of special interest to the student. May be repeated for additional credit as the topics vary and with departmental approval. No more than six hours may apply toward the major in philosophy. *(On demand)*

Undergraduate/Available for Graduate Credit

Additional work required for graduate credit.

PHIL 4050. Topics in Philosophy. (3) (3G) Prerequisite: consent of the department. Extra work is required of students receiving graduate credit. Selected problems and issues in philosophy. May be repeated for additional credit as topics vary. *(On demand)*

PHYSICS (PHYS)

Undergraduate

PHYS 1101. Introductory Physics I. (S) (3) Corequisite: PHYS 1101L. Introduction to the fundamental principles of natural phenomena. Topics will be selected from traditional classical subjects (e.g., Newtonian mechanics, electromagnetism) and more recent developments (e.g. nuclear physics, quantum physics) in order to illustrate the logical structure of modern science. *(Fall, Spring, Summer)*

PHYS 1101L. Introductory Physics I Laboratory. (S) (1) Corequisite: PHYS 1101. Laboratory investigations illustrating experimental techniques and fundamental principles of natural phenomena. Three laboratory hours each week. *(Fall, Spring, Summer)*

PHYS 1102. Introductory Physics II. (S) (3) Corequisite: PHYS 1102L; Prerequisite: PHYS 1101. A continuation of PHYS 1101. *(Fall, Spring, Summer)*

PHYS 1102L. Introductory Physics II Laboratory. (S) (1) Corequisite: PHYS 1102; Prerequisite: PHYS 1101L. A continuation of PHYS 1101L. Three laboratory hours each week. *(Fall, Spring, Summer)*

PHYS 1130. Introduction to Astronomy. (S) (3) Historical beginnings of astronomy. Motions of celestial bodies. Introduction to space science. The solar system. Optical and radio astronomy. Structure and evolution of stars. Galaxies, cosmology. Three lecture hours each week. If taken together with 1130L, the combination can be counted toward the general degree requirements in natural science. *(Fall, Spring, Summer)*

PHYS 1130L. Introduction to Astronomy Laboratory. (S) (1) Prerequisite or corequisite: PHYS 1130. Experimental investigations relating to the acquisition of and interpretation of astronomical data. One three-hour laboratory each week. *(Fall, Spring) (Evenings)*

PHYS 2101. Physics for Science and Engineering I. (S) (3) Prerequisite: MATH 1241. Corequisite: PHYS 2101L, MATH 1242. First semester of a two semester calculus-based introductory sequence in general physics with topics selected from kinematics and dynamics of particles, momentum, work, energy, conservation laws, mechanics of rigid bodies, heat, thermodynamics, fluids, electricity and magnetism, wave motion and sound, geometrical and physical optics. Three lecture hours and one recitation hour each week. *(Fall, Spring, Summer) (Evenings)*

PHYS 2101L. Laboratory I. (S) (1) Corequisite: PHYS 2101. Experiments selected from mechanics, heat, electricity and magnetism, wave motion and optics. Use of the computer for organizing, graphing and analyzing data. Two laboratory hours each week. *(Fall, Spring, Summer) (Evenings)*

PHYS 2102. Physics for Science and Engineering II. (S) (3) Prerequisite: PHYS 2101 with a grade of C or better, and MATH 1242. Continuation of PHYS 2101. Three lecturer hours and one recitation hour each week. *(Fall, Spring, Summer) (Evenings)*

PHYS 2102L. Laboratory II. (S) (1) Prerequisite: PHYS 2101L. Corequisite: PHYS 2102. Continuation of PHYS 2101L. Two laboratory hours each week. *(Fall, Spring, Summer) (Evenings)*

PHYS 2181. Electronics and Microcomputer Interfacing. (4) Prerequisites: PHYS 2102 and 2102L (or PHYS 1102) with a grade of C or better, and MATH 1242. Study of analog and digital electronics and microcomputer interfacing, including logic gates, counters, decoders, flip-flops, latches, memories, operational amplifiers, analog-to-digital and digital-to-analog converters, IEEE-488, RS-232C and current loop interfaces, interrups, BASIC programming, and microcomputer input-output techniques. Six lecture/laboratory hours per week. *(Spring)*

PHYS 3000. Topics in Physics. (S) (1-4) Prerequisite: consent of department. Special topics which are introductory in nature. May not be applied toward the degree requirements for "additional hours at the 3000/4000 level" without approval of the departmental Undergraduate Studies Committee. May be repeated. *(On demand)*

PHYS 3101. Topics and Methods of General Physics. (S) (4) Prerequisite: PHYS 2102 (or PHYS 1102) with a grade of C or better, and MATH 1242. Exercises and problems to further explore topics in PHYS 2101 and 2102 with emphasis on understanding of physical concepts and developing computer methods of explorationand solution using Mathematics and Excel. *(Spring)*

PHYS 3121. Classical Mechanics 1. (3) Prerequisites: PHYS 3101 (or EEGR 3121 or ESGR 2142) with a grade of C or better, and MATH 2171. Corequisite: MATH 2241. First course of a two-semester sequence treating particle dynamics, the motion of systems of particles, rigid body motion, moving coordinate systems. Lagrange's equations, Hamilton's equations and small oscillations. *(Fall)*

PHYS 3141. Introduction to Modern Physics. (3) Prerequisite: PHYS 2102 (or PHYS 1102) with a grade of C or better, MATH 1241. Corequisite: MATH 1242. Special relativity, kinetic theory, quantization of charge, light, and energy, the nuclear atom, electron waves, molecular and solid state physics, statistical physics, and an introduction to the physics of atoms. *(Fall)*

PHYS 3151. Thermal Physics. (3) Prerequisites: PHYS 3141 with a grade of C or better, CHEM 1251 and 1251L, MATH 2241. An introduction to heat, thermodynamics, kenetic theory, and statistical physics. Topics include classical thermodynamics, classical and quantum theory of specific heats, Maxwell-Boltzmann, Fermi-Dirac and Bose-Einstein distributions. Three lecture hours a week. *(Spring) (Alternate years)*

PHYS 3281. Advanced Laboratory in Waves and Optics. (2) Prerequisites: PHYS 2102 and 2102L (or PHYS 1102) with a grade of C or better, and MATH 1242. Selected laboratory work in physical optics. Areas of study include properties of light sources and detectors; interferometry; fiber optics; optical retardation; and dispersion. Emphasis on the development of sound laboratory techniques, methods of data analysis, and the writing of formal laboratory reports. Three hours of laboratory each week. *(Fall)*

PHYS 3285. Advanced Experimental Physics. (W) (3) Prerequisites: PHYS 3121 and 3141 with a grade of C or better. *(Spring)*

PHYS 3400. Internship in Community Education and Service. (3) Prerequisites: junior standing, acceptance into the internship program and approval by the Physics Department. A project oriented, service-learning internship with cooperating community organizations. Does not count as credit toward departmental requirements in physics. May be repeated once with permission of the department. This course is offered on a *Pass/No Credit basis. (On demand)*

PHYS 3590. Physics Cooperative Work Experience. (0) Prerequisites: junior standing and consent of department. Registration in PHYS 3590 is required of Co-Op students during each of the semesters they are working. **(***Fall, Spring, Summer***)**

PHYS 3900. Senior Project. (2-3) Prerequisites: senior standing and consent of the faculty member overseeing the project; PHYS 3285. Independent investigation under the supervision of faculty member on a project that is approved by the departmental Undergraduate Studies Committee. *(On demand)*

Undergraduate/Available for Graduate Credit

*Courses indicated by * may be applied toward the 30 hours of coursework required for the master's degree in Physics.*

PHYS 4000. Selected Topics in Physics. (1-4) (1-4G) Prerequisite: consent of department. Advanced special topics. May not be applied toward the degree requirements for "additional hours at the 3000/4000 level" without approval of the departmental Undergraduate Studies Committee. May be repeated. **(***On demand***)**

PHYS 4140. Nuclear Physics. (3) (3G) Prerequisites: PHYS 3141 with a grade of C or better, and MATH 2171. A study of the nucleus, radioactivity, nuclear reactions, fission, fusion, interactions of radiation with matter and measurement of radiation. *(Spring) (Alternate years)*

PHYS 4181. Solid State and Semiconductor Physics Laboratory. (3) (3G) Prerequisite: PHYS 4241 or ESGR 3131 or consent of instructor. Laboratory in solid state physics and semiconductor device physics, including electrical and photoconductivity; fluorescence, photoluminescence and Raman Scattering; semiconductor device characteristics; superconductivity; and the Hall Effect. Six laboratory hours each week. *(On demand)*

***PHYS 4222. Classical Mechanics II. (3) (3G)** Prerequisite: PHYS 3121, MATH 2241.

PHYS 4231. Electromagnetic Theory I. (3) (3G) Prerequisites: For physics majors, PHYS 3121 with a grade of C or better; Others: consent of the instructor, MATH 2771, MATH 2241. Corequisite: MATH 2242. **(***Spring***)**

PHYS 4232. Electromagnetic Theory II. (3) (3G) Prerequisites: PHYS 4231 with a grade of C or better. *(Fall)*

PHYS 4241. Modern Physics I. (3) (3G) Prerequisites: For physics majors, PHYS 3141 with a grade of C or better; Others: consent of the instructor; MATH 2241 and 2171. The first semester of a two semester sequence providing a senior-level treatment of physical systems at the level of atoms. Topics selected for Realativity, quantum phenomena, ionic and covalent bonding in molecules, electrical, thermal, and magnetic properties of solids, Mazwellian and Boltzmann distributions, solutions of the one-dimensional Schrodinger wave equation, the hydrogen atom and spin, the helium atom, atomic and molecular spectra. *(Fall)*

PHYS 4242. Modern Physics II. (3) Prerequisite: PHYS 4241. A continuation of PHYS 4241. *(Spring)*

PHYS 4271. Waves and Optics. (3) (3G) Prerequisites: PHYS 2102 with a grade of C or better, senior standing, and MATH 2171. Exceptions by consent of the instructor.

Topics include the mathematics of wave motion, light as an example of an electromagnetic wave, the superposition of periodic and non-periodic waves, and selected topics from geometrical and physical optics. *(Fall)*

PHYS 4281. Advanced Laboratory in Modern Optics. (3) (3G) Prerequisite: PHYS 4271 or consent of the instructor. Laboratory in modern optics. Characteristics of light sources and detectors; interferometry; fiber optics and fiber optics sensors; holography; heterodyned optical signals. Emphasizing sound techniques, methods of data analysis, and written laboratory reports. Credit cannot be obtained for both PHYS 3281 and PHYS 4281. Six hours each week. *(Fall)*

PHYS 4800. Investigations. (1-2) (1-2G) Prerequisite: junior standing. An independent investigation on a topic approved by the department Undergraduate Studies Committee. May be repeated for up to four hours credit. No more than two credit hours may be applied toward the degree requirements for "additional hours at the 3000/4000 level". (*On demand*)

Graduate and Advanced Undergraduate

PHYS 5000. Selected Topics in Physics. (0-4) (0-4G) Prerequisite: consent of department. Selected advanced topics in physics. May be repeated with approval of the department. (*On demand*)

PHYS 5210. Theoretical Physics. (3) (3G) Prerequisite: consent of department. Topics include: Matrices, power series, solutions to ordinary and partial differential equations, Hilbert space, Fourier integrals, boundary value problems, Green's functions, and complex analysis. (*Fall*)

PHYS 5211. Fundamentals of Modern Optics. (3) (3G) Prerequisite: PHYS 4241 or consent of department. Wave nature of light, basic semiconductor properties, light sources, light detectors and modulators, optical waveguides, optical systems with applications, and selected topics in non-linear optics. (*Fall*)

PHYS 5220. Computational Methods in Physics. (3) (3G) Prerequisite: consent of department. Use of computers in solving physics problems including computational and mathematical methods to solve problems in classical mechanics, quantum mechanics, electromagnetism, nuclear physics, optics, and solid state physics. Computer solutions include numerical methods of integration, solving differential equations, curve fitting, and statistical analysis in physics. (*On demand*)

PHYS 5281. Modern Optics Laboratory. (3) (3G) Prerequisite: consent of instructor. Selected experiments in such modern optics areas as fiber optic, holography, spectroscopy, and fourier optics. Six laboratory hours each week. (*Spring*)

Graduate Only

PHYS 6121. Classical Dynamics. (3G) Prerequisite: PHYS 4222. Variational principles and Lagrange's equations. Hamilton's principles and mechanics of particles. The two body central force problem. Rigid body motion. Small oscillations and the eigenvalue equation. (*Spring*) *(Alternate years)*

PHYS 6131. Classical Electromagnetism I. (3G) Prerequisite: PHYS 4232. Electrostatic and boundary value problems. Multipole expansions, dielectrics and magnetostatics. Maxwell's equations, time varying fields and conservation laws. Plane electromagnetic waves and wave propagation. Wave guides and resonant cavities. Simple radiating systems. Scattering and diffraction theory. (*Fall*) *(Alternate years)*

PHYS 6132. Classical Electromagnetism II. (3G) Prerequisite: PHYS 6131. Special theory of relativity. Dynamics of relativistic particles and electromagnetic fields. Charged particle collisions and scattering. Radiation by moving charges. Bremsstrahlung, virtual quanta, and beta decay theory. Multipole expansion and fields. Radiation damping. Self fields of particles. Scattering and absorption of radiation by a bound system. (*On demand*)

PHYS 6141. Quantum Theory I. (3G) Prerequisite: PHYS 4242. Non-relativistic wave mechanics. The Schrodinger equation, linear harmonic oscillator and WKB approximation. Central forces and angular momentum. The hydrogen atom. (*Fall*) *(Alternate years)*

PHYS 6142. Quantum Theory II. (3G) Prerequisite: PHYS 6141. Scattering theory, linear vector spaces, spin, two level systems. Quantum dynamics, symmetry operations, bound state and time-dependent pertubation theory. Theory of scattering, angular momentum, and identical particles. (*On demand*)

PHYS 6201. Fourier Optics and Holography. (3G) Prerequisite: PHYS 4271 or consent of department. Principles of scalar, Fresnel, and Fraunhofer diffraction theory. Coherent optical imaging systems, optical filtering, optical data processing, and holography. Application of Fourier optics and holography. (*Fall*)

PHYS 6211. Quantum Electro-Optics. (3G) Prerequisite: PHYS 4271 or consent of department. Theory of laser oscillation, optical resonators, interaction of radiation and atomic systems, giant pulsed lasers, laser systems. Wave propogation in non-linear media, modulation of optical radiation, noise in optical detection and generation. Interaction of light and sound. Laser types and applications including the free-electron laser. (*Spring*)

PHYS 6251. Statistical Physics. (3G) Prerequisite: PHYS 3151 or consent of department. Classical and quantum statistical mechanics. Statistical thermodynamics. Ensembles, partition functions, fluctuations, ideal Fermi and Bose gas systems. (*On demand*)

PHYS 6261. Nuclear and Particle Physics. (3G) Prerequisite: PHYS 4140 or consent of department. Properties of nuclei, nuclear models, and interactions. Nuclear reactions, fission, and fusion. Alpha, beta, and gamma decay. One and two particle states. Relativistic kinematics, principle of invariance, quantum numbers, elementary particles and models. (*On demand*)

PHYS 6271. Advanced Solid State Physics. (3G) Prerequisite: consent of department. Crystal structure. Electromagnetic, electron, mechanical, and elastic wave interactions with crystals. Theory of X-ray diffraction.

Energy band theory of metals and semiconductors. Optical properties of solids, phase transitions, and amorphous solids. Quantum mechanics of covalent bonding, phonon excitation, and thermal energy. (*On demand*)

PHYS 6900. Physics Thesis Research. (0-4G) Prerequisite: consent of department. Research for the thesis. A student must enroll for a cumulative minimum of six hours credit but may receive no more than 10 hours credit. (*Fall, Spring, Summer*)

PHYS 7999. Graduate Residence. (0G) Prerequisite: consent of thesis adviser. Required of all graduate students not enrolled in other courses who are working on or defending theses and/or are scheduled for comprehensive examinations. *(Fall, Spring)*

POLITICAL SCIENCE (POLS)

Course offerings, including introductory courses, are divided into the following major subfields: American Politics and Public Administration, Comparative Politics and Area Studies, International Politics, Political Philosophy, and Research.

American Politics and Public Administration

Undergraduate

POLS 1110. Introduction to American Politics. (C) (3) Role of the President, Congress, Supreme Court and national administrative agencies in the American political system. Relationship between the American people and their political institutions with emphasis on political culture, the electoral process, political parties, interest groups and political communication. (*Fall, Spring, Summer*)

POLS 3010. Topics in American Politics or Public Administration. (1-4) An intensive study of a topic in American politics or public administration. The particular topic investigated may vary from semester to semester, and a student may take more than one course under this number. (*On demand*)

POLS 3103. Public Opinion. (3) A study of attitude and opinion measurement with emphasis on the techniques of survey research and public opinion polling and conservative and liberal tendencies in American public opinion and society. (*On demand*)

POLS 3104. Mass Media. (3) Relationship between the media in the United States and (1) the political activities of individual citizens and (2) governmental policy making. Ownership and control of the media, government regulation of the media, news programming and media impact on voter behavior and governmental policy making bodies. (*On demand*)

POLS 3105. Voting and Elections. (3) Psychological, sociological and political variables that influence voting behavior and that affect electoral stability and change with emphasis on studies derived from survey research. (*On demand*)

POLS 3109. Political Parties and Interest Groups. (3) Analysis of the role played by political parties and interest groups in the American political system. (*On demand*)

POLS 3110. North Carolina Student Legislature. (3) Prerequisite: permission of instructor. Practicum including workshops, seminars and guest speakers on legislative process and research, parliamentary procedure, and resolution and bill drafting; participation in an interim council debate at one of the member campuses for one weekend each month during the semester and participation in the NCSL annual session in Raleigh. May be repeated for credit. (*Spring*)

POLS 3111. The Congress. (3) Analysis of the role of the Congress in the American political system and its relationships with the other branches of government. Recruitment and socialization of congressmen, the committee system and roll call analysis. (*On demand*)

POLS 3112. The Presidency. (3) Analysis of the role of the Presidency in the American political system and its relationships with the other branches of government. Strategies of presidential nomination and election, the sources and indicators of presidential power, how those who have held the office have shaped it and been shaped by it. (*On demand*)

POLS 3114. Constitutional Law. (3) Studies the development of American Constitutionalism (especially federalism and the separation of powers) with a major emphasis on the role of the United States Supreme Court in national policy making. (*On demand*)

POLS 3115. Civil Rights and Liberties. (V) (3) (Closed to students who have completed POLS 3117.) Utilizes public policy analysis to illuminate judicial decisions and opinions relating to contemporary civil rights and liberties. (*On demand*)

POLS 3116. Judicial Process. (3) Introduction to the nature and functions of law; survey of Supreme Court decision making. (*On demand*)

POLS 3118. Law and Social Change. (3) Employs models of the interactions between law and social change to assess the strengths and weaknesses of judicial institutions as they attempt to develop policies to respond to, or promote, major societal changes. (*On demand*)

POLS 3119. State Politics. (3) The study of the politics of state governments in the United States using a comparative approach to analyze differences in their formal governmental structures, political climates and the processes by which public policies are adopted. (*On demand*)

POLS 3121. Urban Politics. (3) Analysis of the political processes in the nation's metropolitan areas and the adjustments and responses of the U.S. governmental system to cope with the urban area. (*On demand*)

POLS 3122. Urban Politics Simulation. (3) An urban political simulation game in which students participate as appointed and elected officials. Focus on urban political activity (city and county), the planning and passing of budgets, election campaigning, and citizen participation in local government. *(Pre-Session)*

POLS 3124. U.S. Domestic Policy. (3) Examination of the processes of and influences on policy making, including

goals and objectives of current U.S. domestic policy. Focus on major policy areas; may include such topics as fiscal and monetary policy, education, transportation, management of national economy, and agriculture, among others. (*On demand*)

POLS 3126. Administrative Behavior. (3) The role of the administrator and public bureaucracy in modern democratic society with emphasis on the interplay of forces created by executives, legislators, political parties and interest groups. (*On demand*)

Comparative Politics and Area Studies

POLS 1130. Introduction to Comparative Politics. (X) (3) Political comparison among nations, diverse geographical emphases, including Latin America, Europe, Asia and Africa. (*Fall, Spring, Summer*)

POLS 3030. Topics in Comparative Politics or Area Studies. (1-4) An intensive study of a topic in comparative politics or area studies. The particular topic investigated may vary from semester to semester, and a student may take more than one course under this number. (*On demand*)

POLS 3131. Political Development. (3) Comparative study of how and why political systems change, with particular emphasis on the politics and political economy of countries in the Third World. (*On demand*)

POLS 3135. Political Violence. (3) Designed to address four questions: (1) What is political violence? (2) Why does it occur? (3) What is its relationship to other political processes? (4) What is its impact on society? The emphasis of this course, while drawing on examples from contemporary American and foreign scenes, is on examining manifestations of violent political behavior such as pathological violence, conspiratorial violence, collective violence and government violence. (*On demand*)

POLS 3137. Political Corruption. (V) (3) The use of public office for private ends in comparative and historical perspective. Examples are drawn from the Third World, Western Europe, socialist systems, and the local, state, and national levels in the United States. (*On demand*)

POLS 3141. European Politics. (3) Comparative analysis of selected European governments including Great Britain, France, Germany and Italy. (*On demand*)

POLS 3143. African Politics. (3) A comparative perspective on politics in sub-Saharan Africa and on the performance of post-independence political systems there in terms of national and international integration, economic challenges, and efforts to create stable and democratic civilian regimes. (*On demand*)

POLS 3148. Chinese Politics. (3) The origins, development and maintenance of the Chinese political system. The organization and function of the Chinese Communist Party (CCP) and other political groups. The impact of tradition on contemporary Chinese politics. (*On demand*)

POLS 3149. Japanese Politics (3) Political behavior and development of political institutions in Japan. Emphasis on nature of political change and political process--political socialization, political culture, party systems, interest groups and public policy formation. Cross-national comparison with non-Asian democratic systems. (*On demand*)

International Politics

POLS 1150. Introduction to International Politics. (X) (3) Analysis of politics among nations: material and psychological sources of national power; the role of law, force and diplomacy in world politics; problems of peace and disarmament; and international organization. (*Fall, Spring, Summer*)

POLS 3050. Topics in International Politics. (1-4) An intensive study of a topic in international politics. The particular topic investigated may vary from semester to semester, and a student may take more than one course under this number. (*On demand*)

POLS 3151. International Political Economy. (3) An analysis of the political dynamics of economic relation-ships among countries. Attention is focused on the political aspects of monetary, trade, and investment relationships, and the difficulties involved in coordinating policy and maintaining effective international manage-ment. (*On demand*)

POLS 3157. American Foreign Policy. (3) A survey of the key issues affecting the conduct of U.S. foreign policy with attention to the formulation and implementation of foreign policy decisions with particular reference to some of the more critical foreign policy issue areas. (*On demand*)

POLS 3162. International Law. (3) An historical and political analysis of the sources and development of international law. Particular attention is given to the role of modern international law in the relations of nation-states and its application to contemporary global problems. (*On demand*)

POLS 3163. Model United Nations. (3) Prerequisite: permission of instructor. Preparation for and participation in the Model United Nations (simulation of the United Nations). Includes study of the background of country to be represented; the history, structure and procedures of the United Nations; drafting of resolutions and position papers; and public speaking and caucusing. May be repeated for credit. (*Spring*)

POLS 3165. East Asia in World Affairs. (3) Examines the political factors governing diplomatic relations, national order, economic trade and national security in East Asia. Emphasis on China, Taiwan, Hong Kong, Japan, the Korean peninsula and the Philippines. (*On demand*)

POLS 3167. U.S. and Japan. (3) A survey of the key elements affecting the structure and direction of U.S. relations with Japan. Emphasis on the major issues affecting the relationship and the efforts to resolve conflicts and maintain patterns of cooperation. (*On demand*)

POLS 3169. Foreign Policy of African States. (3) Prerequisite: any upper division course on Africa. A theoretical approach to the study of external and internal factors influencing the development, implementation, and conduct of foreign policy of African states. Dual-listed with AAAS 4105. (A student cannot receive credit for POLS 3169 and AAAS 4105.) (*Spring*)

Political Philosophy

POLS 3070. Topics in Political Philosophy. (V) (3) Analysis of a selected problem in contemporary political philosophy or in the history of political philosophy. Includes moral and ethical evaluation of political and social practices and institutions. Readings from classic texts or contemporary works. Topic for consideration changes from semester to semester. Course may be repeated with permission of instructor. (*On demand*)

POLS 3171. History of Classical Political Philosophy. (V) (3) Major concepts and systems of political philosophy of Ancient Greece and Rome. (*On demand*)

POLS 3172. African-American Political Philosophy. (3) Prerequisite: 3000 level course on Africa from AAAS, HIST, or POLS. Major competing ideologies in African-American political philosophy. Dual-listed with AAAS 3179. (A student cannot receive credit for POLS 3172 and AAAS 3179.) (*On demand*)

POLS 3173. History of Modern Political Philosophy. (V) (3) Major concepts and systems of western political philosophy from the 16th-19th century. (*On demand*)

POLS 3174. Democracy. (V) (3) Examination of two conceptions of the nature and justification of democracy: liberal democracy and participatory democracy through the use of contemporary political and social research. (*On demand*)

POLS 3175. Law, Justice and Morality. (V) (3) Introduction to ethics with a focus on such contemporary ethical issues as abortion, suicide and euthanasia, capital punishment, and war and terrorism. (*On demand*)

POLS 3177. Social and Political Philosophy. (C) (3) Philosophical concepts involved in understanding and evaluating the basic structure of societies (e.g., economic, educational, legal, motivational and political) including equality, fraternity, freedom and rights. Relevance to contemporary social and political issues stressed. Readings from classical and contemporary sources. Same as PHIL 3226 and taught by the Philosophy Department. (*On demand*)

Research in Political Science

POLS 3220. Research Methods in Political Science. (W) (4) Prerequisites: junior standing; and nine hours of political science, three each in American Politics or Public Administration, International Politics, Comparative Politics and Area Studies; and STAT 1222. An introduction to research methods in political science to include a brief consideration of the following topics: philosophy of science; the place of research methods in the discipline of political science; research design; research strategies and techniques; data interpretation. Three lecture hours and a one-hour lab period per week. (*Fall, Spring*)

POLS 3990. Senior Thesis. (W) (3) Prerequisite: POLS 3220. The student completes an article-length research paper under the supervision of a member of the faculty. The paper must involve quantitative or other methods of modern political analysis. (*Fall, Spring, Summer*)

Internship and Independent Study

POLS 3400. Internship in Political Science. (3-6) Practical experience in politics by working for a party, campaign organization, political office holder, news medium, government agency or other political organization. Minimum of 150 working hours for three hours credit; minimum of 300 working hours for six hours credit. No more than six credits may be received through this course. *Pass/No Credit* grading only. (*Fall, Spring, Summer*)

Undergraduate/Available for Graduate Credit

Additional work required for graduate credit.

POLS 4610. Challenges of Democracy. (3) (3G) Seminar on a current challenge to democratic practice in the United States to examine sources and consequences of the challenge and possible solutions. The topic changes from year to year. The class conducts a public forum on the challenge at the end of the semester. Graduate students are expected to prepare a research paper, lead the forum, and otherwise perform above the level of undergraduates. (*Fall*)

POLS 4800. Independent Study. (1-3) (1-3G) Prerequisite: consent of the instructor. Supervised investigation of a political problem that is (1) of special interest to the student; (2) within the area of the instructor's special competence; and (3) normally an extension of previous coursework with the instructor. A student may take more than one course under this number but not more than three hours a semester. (*Fall, Spring, Summer*)

Graduate Only

POLS 6000. Topics for Graduate Study in Political Science. (1-4G) Intensive study of a topic in Political Science. The topic of investigation may vary from semester to semester. May be repeated for credit. (*On demand*)

POLS 6195. Robert A. Taft Institute of Government. (3G) Open under special arrangement on a *Pass/No Credit* basis. (*Summer*)

POLS 6196. Urban Systems for School Administrators. (3G) Corequisite: HIST 6196. An interdepartmental, team-taught course which consists of a survey of the courses and consequences of urbanization in the United States with particular attention to the urban South. Urbanization is treated as a system linking historic, political, economic and social factors, particularly since 1945. (*Summer*)

PSYCHOLOGY (PSYC)

Undergraduate

PSYC 1101. General Psychology. (S or C) (3) A survey of the field including such topics as learning, emotions, motivation, personality, psychological testing and abnormal

behavior. Emphasis on psychology as a behavioral science. May be taken with or without the lab. All psychology majors and those who wish to apply this course as partial fulfillment of the University science and technology (GOAL IV) requirement must take PSYC 1101L during the same semester in which they take PSYC 1101. *(Fall, Spring, Summer) (Evenings)*

PSYC 1101L. General Psychology Laboratory. (S) **(1)** An introduction to laboratory equipment and procedures. Meets two hours per week. (May not be taken apart from the lecture portion of PSYC 1101 except by permission of the department.) *(Fall, Spring, Summer) (Evenings)*

PSYC 2102. Research Methodology. (W) (4) Prerequisites: PSYC 1101 and 1101L, and STAT 1222. Experimental, observational and correlational methods of psychological research. Basic concepts of philosophy of science will also be discussed. Emphasis on methodology rather than content and applicability of methods to current topics in psychology. Three lecture hours and one two-hour laboratory period a week. *(Fall, Spring)*

PSYC 2109. Educational Psychology. (3) Prerequisite: PSYC 1101. The psychology of learning, human development, assessment and other domains applicable to formal educational settings. *(Fall, Spring)*

PSYC 2112. Introduction to Behavior Modification. (4) Prerequisite: PSYC 1101. Methods and constructs of behavior modification including the application of the methods to laboratory research. Three lecture hours and one two-hour laboratory period a week. *(Fall)*

PSYC 2120. Child Psychology. (C) (3) Prerequisite: PSYC 1101. Psychological development in infancy and childhood, including such topics as biological change, learning, thought, language, social relations, intelligence and morality. *(Fall, Spring, Summer)*

PSYC 2121. Adolescent Psychology. (3) Prerequisite: PSYC 1101. Developmental and psychological characteristics of adolescents with emphasis on the developmental transitions, social contexts and problems of adolescence. *(Fall, Spring)*

PSYC 2124. Psychology of Adult Development and Aging. (C) (3) Psychological development through adulthood and old age. Emphasis on processes underlying continuity and change in adulthood, including personality and socialization, cognitive development and the psychophysiology of aging. (Same as GRNT 2124) *(Fall)*

PSYC 2150. Psychology of Adjustment. (3) Prerequisite: PSYC 1101. The study of the process of adjustment. Consideration is given to psychological reactions to critical problems encountered in modern life. Introduction to different approaches to psychotherapy. *(Fall, Spring, Summer)*

PSYC 2171. Introduction to Industrial/Organizational Psychology. (3) The study of people at work; what motivates people to work and what leads to satisfaction, alienation or performance; how to lead others; the structure of an organization and processes of communication, decision making and conflict; socialization through selection and training; measurement of individual contributions; the design of work itself; ways to change and develop entire organizations. *(Fall, Spring, Summer)*

PSYC 3001. Topics in Psychology. (3) Prerequisite: consent of the instructor. Examination of special psychological topics. May be repeated for credit as topics vary.

PSYC 3103. History and Systems of Psychology. (3) Prerequisite: PSYC 1101. Historical antecedents and origins of modern psychology. Emphasis on influential psychological systems such as behaviorism and psychoanalysis. *(Fall, Spring, Summer)*

PSYC 3110. Comparative Psychology. (3) Prerequisite: PSYC 1101. Animal and human behavior from a comparative point of view. Includes the study of methodology, classification of behavior patterns as well as the origin of these patterns. *(Fall, Spring, Summer)*

PSYC 3111. Psychology of Learning. (3) Prerequisite: PSYC 1101. (Completion of PSYC 2102 is strongly recommended.) Major theories and empirical findings in the area of learning. *(Fall, Spring)*

PSYC 3112. Consequences and the Sources of Behavior Control. (4) Prerequisite: PSYC 2112. Application of the principles and techniques of the experimental analysis of behavior to a variety of behavior problems in a number of different environments with an emphasis on extrapolation to new and different problems and settings. (Students will be required to develop individualized projects utilizing the material discussed in class.) *(On demand)*

PSYC 3113. Physiological Psychology. (3) Prerequisite: PSYC 1101. The relationship of physiological systems to integrated behavior and an introduction to brain-behavior relationships. Emphasis on neural regulation of behavior. *(Fall, Spring, Summer)*

PSYC 3114. Motivation. (3) Prerequisite: PSYC 1101. Current theories and research in the area of motivation. Consideration is given to the role of emotion in human motives. *(Fall, Spring)*

PSYC 3115. Sensation and Perception. (3) Prerequisite: PSYC 1101. (Completion of PSYC 2102 is strongly recommended.) Sensory and perceptual processes, including such topics as psychophysics, information processing and color. *(Fall, Spring)*

PSYC 3116. Human Cognitive Processes. (C) (3) Prerequisite: PSYC 1101. Processes involved in such complex human behaviors as language (acquisition and usage), memory and problem solving with emphasis upon experimental findings and current theories. *(Fall, Spring)*

PSYC 3117. Hereditary Behavior. (3) Prerequisite: PSYC 1101. Genetic and environmental contributions to behavior and psychological processes. History of the nature-nurture issue in psychology; animal and human research methods; statistical analysis of behavior-genetic data; and the

heritability of learning ability, intelligence, personality and psychopathology. (*Yearly*)

PSYC 3118. Research Methods in Physiological Psychology. (4) Prerequisites: PSYC 1101 and permission of the instructor. Current laboratory techniques in physiological psychology, including basic surgeries, lesioning, stimulation, recording and histology. Three lecture hours and one two-hour laboratory period a week. (*On demand*)

PSYC 3122. Cognitive and Language Development. (3) Prerequisites: PSYC 1101 and 2120. Theory and research on the development of thought and language in children including such topics as information processing, Piaget's theory of cognitive development, and various approaches to the acquisition of language. (*Yearly*)

PSYC 3123. Social and Personality Development. (3) Prerequisites: PSYC 1101 and 2120. Social and personality development of children, including such topics as infant social behavior, socialization practices, independence and achievement, aggression, sex-role development and moral development. (*Yearly*)

PSYC 3125. Older Worker and Retirement. (W) (3) Prerequisite: consent of the instructor. Physical characteristics, personal attitudes, and structural factors affecting the employment of persons over 40. Topics include biological aging, myths and stereotypes about older workers, public policies, human resources practices, economics of retirement, and theories about career and life stages. *(Yearly)*

PSYC 3130. Social Psychology. (C) (3) Prerequisite: PSYC 1101. The social behavior of individuals. Individuals' behavior in relation to others. Attitude change, social conflict, social interaction, social perception and social influence processes; general theories of social behavior and research approaches. (*Fall, Spring, Summer*)

PSYC 3135. Psychology of Personality. (C) (3) Prerequisite: PSYC 1101. Current personality theories. Consideration given to psychoanalytic, physiological, trait and factor, the perceptual viewpoints in the light of contemporary research. (*Fall, Spring, Summer*)

PSYC 3140. Basic Processes in Psychological Assessment. (3) Prerequisites: PSYC 1101 and 1101L, and STAT 1222; PSYC 2102 recommended. Psychological testing, including scaling procedures, reliability and validity, correlational techniques used in test construction, a review of various kinds of psychological tests and basic approaches to test interpretation. (*Fall, Spring*)

PSYC 3151. Abnormal Psychology. (C)(3) Prerequisite: PSYC 1101. A history of psychopathology. Case studies, differential diagnosis, psychological dynamics of abnormal behavior, including theoretical, clinical and experimental contributions in the field. (*Fall, Spring, Summer*)

PSYC 3152. Child Psychopathology. (3) Prerequisites: PSYC 1101, 2120 and 3151. Principles of classification, assessment and treatment of children and adolescents who display deviant affective, cognitive and social behavior. (*Yearly*)

PSYC 3155. Community Psychology. (3) Social forces, particularly within the context of organizations and/or communities, which affect the development of psychopathology and/or personal competency, with emphasis on preventing psychopathology and increasing competency. Topics include the concept of prevention; assessment of organizations; communities and other environments; methods of instituting organizational and community change; evaluating the effects of community interventions; social policy analysis; and ethical issues involved in community work. (*Yearly*)

PSYC 3172. Psychology of Personnel: Employee Selection and Classification. (3) Prerequisite: PSYC 2171 or consent of instructor. Methods, techniques and procedures used to select and classify employees. (*Fall*)

PSYC 3173. Psychological Bases of Training Programs. (3) Prerequisites: PSYC 1101 and 2171, or consent of instructor. Application of alternative theories about adult learning to the development and conduct of training programs in industry. Topics include how to develop training needs, a description of methods available to trainers such as programmed instruction and sensitivity training, and how to evaluate the effects of various training techniques. (*Spring*)

PSYC 3313. Neuropsychology. (3) Prerequisite: PSYC 3113 or equivalent. Brain function and behavior, especially in individuals believed to be brain damaged (e.g., by stroke, Alzheimer's, or head injury); general principles of brain function and of human neuropsychology, including higher functions (e.g., memory and language); neuropsychological assessment. *(Fall)*

PSYC 3316. Cognitive Neuroscience. (3) Prerequisite: PSYC 3113 or 3116. Biological basis of consciousness and the neurobiology of mental processes by which we perceive, act, learn, and remember; representation of mental processes from electrophysiological and brain imaging techniques, clinical neurology, and computational science. *(Spring)*

PSYC 3405. Practicum in Applied Psychology. (1-4) Prerequisites: junior standing and permission of the instructor and the Psychology Department. Work in practical settings related to psychology under the supervision of a faculty member. May be repeated for credit with departmental permission. The student must have obtained approval in the semester preceding the semester in which the practicum is to be taken. Offered only on a *Pass/No Credit* basis. (*Fall, Spring*)

PSYC 3612. Seminar in Behavior Modification. (3) Prerequisites: PSYC 2102, 2112 and 3112. Current issues in behavior modification, including an integration of principles, techniques and practical experiences. Emphasizes development of written and oral communication skills. (*On demand*)

PSYC 3613. Seminar in Physiological Psychology. (3) Prerequisites: PSYC 2102, and permission of the instructor. PSYC 3113 or equivalent recommended. Intensive study of selected topics in physiological psychology, such as psychopharmacology, biofeedback and self-regulation, and sleeping and waking. Emphasizes development of written and oral communication skills. (*Yearly*)

PSYC 3619. Seminar in Experimental Psychology. (3) Prerequisites: PSYC 2102, and permission of the instructor. In-depth examination of an area of current concern in the psychological laboratory. Each semester will have a different focus such as discrimination, learning, memory, experimental analysis of behavior and attention. Emphasizes development of written and oral communication skills. (*Yearly*)

PSYC 3625. Seminar in Developmental Psychology. (3) Prerequisites: PSYC 2102, permission of the instructor, and either 2120, 2121, or 2124. Concentrated examination of selected current issues and research in a field of developmental psychology. Emphasizes development of written and oral communication skills. (*Yearly*)

PSYC 3630. Seminar in Social Psychology. (3) Prerequisites: PSYC 2102, 3130, and permission of the instructor. Intensive study at the advanced level of topics of current research and theoretical interest in social psychology. Emphasizes development of written and oral communication skills. (*Yearly*)

PSYC 3650. Seminar in Human Adaptation and Behavior. (3) Prerequisites: PSYC 2102, and permission of the instructor. Intensive reading and discussion in selected areas of psychology, such as stress, personality, emotions and psychopathology. Emphasizes development of written and oral communication skills. (*Yearly*)

PSYC 3655. Seminar in Community Psychology. (3) Prerequisites: PSYC 2102, 2150, 3151, or permission of the instructor. Application of psychological research findings to specific problems in the community with emphasis on problems hypothesized directly to affect psychological well-being. Emphasizes development of written and oral communication skills. (*Yearly*)

PSYC 3670. Seminar in Industrial Psychology. (3) Prerequisites: PSYC 2102, 2171, and permission of instructor. Topics of current concern in industrial/organizational psychology and related disciplines including issues that affect individuals at work and organizations in society. Emphasizes development of written and oral communication skills. (*Yearly*)

PSYC 3806. Individual Studies in Psychology. (1-4) Prerequisites: permission of the instructor and the Department. Directed individual study which may take the form of initiating, designing and conducting an original research problem or a critique and synthesis of existing research. May be repeated for credit. The student must have obtained approval in the semester preceding the semester in which the course is to be taken. (*Fall, Spring, Summer*)

Undergraduate/Available for Graduate Credit

Additional work required for graduate credit.

PSYC 4140. Tests and Measurements. (3) (3G) Prerequisite: PSYC 1101. Psychological and educational measurements in current use with emphasis on structure, administration and application of group tests. Individual tests such as Stanford-Binet, WISC and WAIS will be reviewed. (*On demand*)

Graduate and Advanced Undergraduate

PSYC 5006. Selected Topics in Psychology. (3) (3G) Prerequisite: junior, senior or graduate standing. Examination of special psychological topics. (*On demand*)

PSYC 5152. Psychology of Exceptional Children. (3) (3G) Assessing and treating the exceptional child. Emphasis on current research in several diagnostic categories, including the emotionally disturbed, learning disabled, mentally retarded, physically handicapped and gifted. (*On demand*)

PSYC 5153. Psychology of Mental Retardation. (3) (3G) Psychological aspects of mental retardation in relation to adjustment and educational development. Emphasis on current research and intervention strategies. (*On demand*)

Graduate Only

Permission of department required for enrollment in these courses:

PSYC 6010 Topics in Learning and Cognition. (3G) An examination of selected topics in the areas of learning, memory and cognition, and behavior modification, with an emphasis on the applications to the areas of clinical, community and industrial psychology. May be repeated for credit with the permission of department. *(Alternate years)*

PSYC 6015. Topics in Perception and Physiological Psychology. (3G) An examination of selected topics in the areas of sensation and perception, physiological and neuropsychology, with an emphasis on the applications to the areas of clinical, community, and industrial psychology. May be repeated for credit with the permission of department. *(Alternate years)*

PSYC 6020. Topics in Developmental Psychology. (3G) An examination of selected topics in child and adult development, aging, and developmental disabilities, with an emphasis on the applications to the areas of clinical, community, and industrial psychology. May be repeated for credit with the permission of department. *(Alternate years)*

PSYC 6030. Topics in Social Psychology and Personality. (3G) An examination of selected topics in personality and social psychology, with an emphasis on the applications to the areas of clinical, community, and industrial psychology. May be repeated for credit with the permission of department. *(Alternate years)*

PSYC 6050. Topics in Psychological Treatment. (3G) Prerequisite: PSYC 6151. A topical course which will focus on issues in treatment, alternative treatment perspectives, special client populations. May be repeated for credit with departmental permission. (*Yearly*)

PSYC 6099. Topics in Psychology. (3G) A discussion of selected topics in psychology. *(On demand)*

PSYC 6102. Research Design and Quantitative Methods in Psychology. (3G) Prerequisites: MATH 1222 and PSYC 2102 or equivalent. Experimental and correlational methods of psychological research, including single subject designs with emphasis on research design and the application of statistical methods to psychological research. *(Fall)*

PSYC 6107. Ethical and Professional Issues in Psychology. (2G) Roles and responsibilities of psychologists, including ethical standards in professional practice, testing and research; expectations and problems confronting psychologists in industrial, clinical and professional organizations. *(Fall)*

PSYC 6111. Psychology of Learning and Memory. (3G) Principles, theories and current research in learning with emphasis on human learning and memory. *(On demand)*

PSYC 6112. Applied Behavior Analysis. (3G) Use of behavior principles in applied settings. Topics include: behavioral assessment, positive and negative reinforcement, punishment, extinction, stimulus control, maintenance and generalization of behavior change. Each student will design and carry out a behavior change project. *(On demand)*

PSYC 6113. Physiological Psychology. (3G) The relationships between the nervous system and behavior. Topics include the structure of the nervous system and nerve conduction, the functional organization of the central nervous system, neuronal and hormonal control of behavior, biofeedback and other appropriate topics. *(On demand)*

PSYC 6115. Sensation and Perception. (3G) Processes involved in receiving and interpreting sensory data including all the sensory systems with an emphasis on vision. *(On demand)*

PSYC 6120. Developmental Psychology. (3G) Psychological development across the lifespan. *(On demand)*

PSYC 6124. Psychology of Aging. (3G) Psychology of aging with particular emphasis on issues related to community/clinical psychology and industrial/ organizational psychology. Topics include myths and stereotypes about aging, problems faced by older workers, retirement, mental health and normal aging, counseling the older adult, and psychological disorders in later life. *(Spring)*

PSYC 6130. Social Psychology. (3G) Human social behavior; topics include affiliation, person perception, conformity and attitudes. *(On demand)*

PSYC 6135. Psychology of Personality. (3G) A critical evaluation of major personality theories including an extensive survey of current research. *(On demand)*

PSYC 6140. Psychological Measurement and Evaluation. (3G) Prerequisite: PSYC 6102. Measurement of psychological characteristics; scaling, reliability, validity and norms; construction and use of the intelligence tests, personality inventories, interest tests, attitude scales, etc., interviewing, survey techniques and behavioral assessment. *(Spring)*

PSYC 6141. Intellectual Assessment. (4G) Theories of intelligence and methods of intellectual assessment, including practice in administering intelligence tests, interpreting results, and writing evaluation reports. Three lecture hours and one two-hour lab per week. *(Fall)*

PSYC 6142. Personality Assessment. (4G) Prerequisite: PSYC 6151, 6141 or permission of department. Theories and methods used in the assessment of personality and psychopathology, including practice in administering personality tests, interpreting results and writing evaluation reports. Three lecture hours and one two-hour lab per week. *(Spring)*

PSYC 6145. Applied Research Design and Program Evaluation. (3G) Prerequisite: PSYC 6102. Models of evaluative research; also techniques, designs and administration of program evaluation. Topics include role conflicts, entry issues, goal setting, research for program planning and implementation and examples of actual program design and evaluation. *(Spring)*

PSYC 6150. Introduction to Psychological Treatment. (4G) Prerequisite: PSYC 6151. Major approaches to psychological intervention, including psychodynamic, behavioral, humanistic and cognitive-behavioral systems. Emphasis on practical therapy considerations, including crisis intervention, client behaviors at various stages of therapy, handling difficult clients and ethical and professional issues. Three lecture hours and one two-hour lab per week. *(Spring)*

PSYC 6151. Behavior Disorders. (4G) Diagnostic systems in current use and the implications of these systems for psychologists; several perspectives on psychological processes, behavior disorders and diagnosis including psychodynamic, behavioral and social models; practice in diagnostic interviewing. Three lecture hours and one two-hour lab per week. *(Fall)*

PSYC 6153. Classification of Psychological Dysfunctions. (3G) Introduction to systems for classifying psychological disorders for counselors and review of current theoretical, experimental, and clinical perspectives on abnormal psychology, including the current *Diagnostic and Statistical Manual of Mental Disorders*. Credit will not be given for both PSYC 6153 and PSYC 6151. *(Spring)*

PSYC 6155. Community Psychology. (3G) Research, intervention techniques and settings associated with major approaches in community psychology including the mental health, organizational, ecological and social action models. *(Fall)*

PSYC 6171. Industrial/Organizational Psychology. (3G) Human behavior within organizations. Topics include personnel selection and placement, job analysis, motivation, satisfaction, consumer psychology and ergonomics. *(Fall)*

PSYC 6171L. Laboratory in Industrial/Organizational Psychology. (1G) Corequisite: PSYC 6171. Practice in administration and scoring of surveys and tests. Experience in role plays, training practices, and interviews. *(Fall)*

PSYC 6172. Personnel I. (3G) Prerequisite or corequisite: PSYC 6171, 6140. Techniques of applied personnel psychology. Topics include job analysis, testing in industry, interviews, personality measures, assessment centers, job evaluation, and polygraphs. *(Spring)*

PSYC 6173. Individual Dynamics. (3G) The individual within the organization. Special emphasis on theories of motivation and job satisfaction. *(On demand)*

PSYC 6174. Organizational Dynamics I. (3G) Prerequisite: PSYC 6171. Group processes, including group formation, group decision making, leadership and group structure. *(Spring)*

PSYC 6175. Organizational Dynamics II. (3G) Prerequisite: PSYC 6174. Organization theories and organizational change methods. *(Fall)*

PSYC 6176. Counseling Psychology in Organizations. (3G) Application of psychology to special problems within the organization, especially the counseling of employees experiencing life problems: for example, retirement, alcoholism, interpersonal conflict. *(On demand)*

PSYC 6177. Personnel II. (3G) Prerequisite: PSYC 6172. Theoretical bases of personnel psychology. Topics include performance appraisal, legal issues, personnel strategies, validation issues, utility analysis, human resource planning and training. *(Fall)*

PSYC 6450. Practicum in Clinical Psychology. (1-3G) Prerequisites: PSYC 6150 and permission of department. Experience in clinical assessment and/or psychotherapy with clients at local agencies under supervision from a faculty member on campus. May be repeated for credit with departmental approval. (*Fall, Spring, Summer*)

PSYC 6455. Practicum in Community Psychology. (1-3G) Applications of the principles of community psychology to special problems within an organization or community setting. The project might include, but would not be limited to, consultation, program development, training, community education or program evaluation. May be repeated for credit with departmental approval. *(Fall, Spring)*

PSYC 6477. Projects in Industrial/Organizational Psychology. (1-3G) Prerequisite: PSYC 6171. A structured practicum experience or research paper in industrial/organizational psychology. May be repeated for credit with departmental approval. (*Fall, Spring, Summer*)

PSYC 6899. Readings and Research in Psychology. (1-4G) Prerequisite: permission of instructor and department to be obtained in the semester preceding the semester in which the course is to be taken. Individual study in psychology which may take the form of conducting empirical research or formulating a critique and synthesis of existing research. May be repeated for credit. (*Fall, Spring, Summer*)

PSYC 6999. Thesis. (1-3G) The thesis is coordinated with the student's interests and practical experience during the second year to allow the development of an area of specialization. Thesis projects can be of three types: (1) An original experiment that will contribute to the psychological literature; (2) a thorough case analysis including literature review and application; (3) the development of a community psychology program or intervention to accomplish an important, well-defined goal. A completed paper and oral presentation are required. May be repeated for credit with departmental approval. (*Fall, Spring, Summer*)

READING (READ)

Undergraduate

READ 3225. Teaching Reading to Elementary School Learners. (W) (3) Prerequisite: Admission to Teacher Education. Research, theory, and instructional practices related to the reading process and reading instruction in the elementary school; relationship between language development and reading; examination of instructional materials, including literature, basal readers, and informational texts; field-based application of course content. (*Fall, Spring*)

READ 3255. Integrating Reading and Writing Across Content Areas. (W) (3) Prerequisite: Admission to Teacher Education. Theories, research and instructional methods associated with reading and writing in the content areas of the middle and secondary school curriculum. Field-based application of course content. (*Fall, Spring, Summer*)

Graduate and Advanced Undergraduate

READ 5000. Topics in Reading, Language, and Literacy. (1-6) (1-6G) May include classroom and/or clinical experiences in the content area. With department approval, may be repeated for credit for different topics. *(Fall, Spring, Summer)*

READ 5260. Relationship Between Writing and Reading K-12. (3) (3G) Theories, research and instructional methods pertaining to related developmental processes of reading and writing from pre-school through high school. *(Fall, Spring)*

READ 5270. Trends and Issues in Reading and Language Arts. (3) (3G) Theories, research and instructional methods associated with reading and the language arts, preschool through high school; questions of effectiveness related to instructional approaches and materials; related topics such as multicultural literacy, the role of phonics, and assessment. *(Fall, Summer)*

Graduate Only

READ 6000. Topics in Reading, Language, and Literacy. (1-6G) May include classroom and/or clinic experiences in the content area. With department approval, may be repeated for credit for different topics. *(Fall, Spring, Summer)*

READ 6250. Language Development and Reading. (3G) Theories, research, instructional approaches and materials, and evaluation strategies pertaining to the relationship between the development of language competence and performance and the development of reading abilities and interest. *(Fall, Spring)*

READ 6260. Diagnostic Instruction in Reading. (3G) Prerequisite: READ 6250 or permission of instructor. Examination, use, and critique of theories and research about reading processes and problems; diagnostic approaches and techniques; instructional strategies to improve reading proficiency. *(Fall)*

READ 6470. Practicum in Reading Instruction. (3G) Prerequisite: READ 6260 and permission of instructor. Application and evaluation of instructional approaches in reading; working with students and colleagues in planning, implementing, observing and evaluating instruction. *(On demand)*

READ 6480. Seminar on K-12 Reading. (3G) Prerequisites: completion of graduate reading course sequence and permission of instructor. Analysis and investigation of current research, theory, practices and programs in reading, including training and experience in conducting in-service sessions and assisting school staff members in planning, implementing and evaluating the total school program. Offered only on a *Pass/No Credit* basis. *(Spring)*

READ 6800. Individual Study in Reading, Language, and Literacy. (1-6G) Prerequisite: Permission of the student's adviser. Independent study under the supervision of an appropriate faculty member. May be repeated for credit. *(Fall, Spring, Summer)*

READ 7999. Graduate Residence. (0G) Meets Graduate School requirement for continuous enrollment during completion of a capstone project or comprehensive examination. *(Fall, Spring)*

RELIGIOUS STUDIES (RELS)

Undergraduate

RELS 1101. An Introduction to Religious Studies. (L,V,W) (3) An introduction to the study of the religious dimensions of human existence. *(Fall, Spring, Summer) (Evenings)*

RELS 1110. The Long Search. (V) (3) A survey of the major religions of the world based on the film series *The Long Search*. *(On demand)*

RELS 2000. Topics in Religious Studies. (1-3) Credit hours vary with topics. Special topics in Religious Studies. May be repeated for credit as topics vary. *(On demand)*

RELS 2101. Introduction to Western Religious Thought. (WL) (3) The major religions, myths, symbols, ideas and traditions that have informed the fundamental ways people in the West have seen themselves in the world. *(Fall, Spring)*

RELS 2I02. Introduction to Asian Religions. (L or X) (3) Selected religions of Asia such as Islam, Hinduism, Buddhism, and Chinese and Japanese religions. Special emphasis on their world views as expressed in the functional use of myth and symbol in the tradition. *(Fall, Spring, Summer)*

RELS 2104. Hebrew Scriptures/Old Testament. (VL) (3) The Hebrew religious tradition from the perspective of its development in the culture of the ancient Near East. *(Yearly)*

RELS 2105. New Testament and Christian Origins. (VL) (3) Emergence of Christianity in its cultural context. Analysis of selected early Christian writings in English translation. *(Fall, Spring)*

RELS 2108. Religion in American Culture. (C) (3) The role of religion in the shaping of American culture. *(Fall, Spring)*

RELS 2600. Orientation to the Major. (1) Prerequisite: consent of the instructor. An introduction to the critical issues and methods of the academic study of religion in the university. *(Fall, Spring)*

RELS 3000. Topics in Religious Studies. (3) Treatment of a special topic in religious studies. May be repeated for credit as topics vary. *(On demand)*

RELS 3010. Major Figure in Religious Studies. (3) The life and works of a major figure who has contributed to religious studies. May be repeated for credit for different figures. *(On demand)*

RELS 3101. Greek Myths and Religions. (W,L) (3) The gods and goddesses, heroes and heroines in ancient Greek myths and religions; Greek myth and later Western religions; polytheism and monotheism; functions of myth; contemporary interpretations of Greek myth. *(Yearly)*

RELS 3104. Hebrew Prophetic Religion. (3) Prerequisite: RELS 2104 or consent of the instructor. The historical development of the prophetic movement from its origins to its culmination in the classical prophets of the eighth to sixth centuries B.C. *(On demand)*

RELS 3107. The Psalms and Wisdom Literature of Israel. (3) Prerequisite: RELS 2104 or consent of the instructor. The origin and content of the Psalms and the place of wisdom literature in the development of Hebrew thought. *(On demand)*

RELS 3110. Judaism. (3) The development of Jewish religious thought from antiquity to the present. *(Yearly)*

RELS 3I13. Jesus. (3) Prerequisite: RELS 2105 or consent of the instructor. Jesus and the religion he taught from the point of view of the synoptic gospels. *(Alternate years)*

RELS 3116. Paul. (3) Prerequisite: RELS 2105 or consent of the instructor. The writings of St. Paul. The occasion, purpose and significance of each letter for the emerging Christian community. *(Alternate years)*

RELS 3119. Christianity through Art and Architecture. (3) Christian history from the catacombs to the 20th

century. Focus on religious expression in pictorial art, architecture and sculpture. (*On demand*)

RELS 3122. Western Esoteric Traditions. (3) Traditions which emphasize that the highest wisdom is found in the inner self: gnosticism, mysticism, hermeticism, grail legends, alchemy. (*On demand)*

RELS 3125. Medieval Christianity. (3) Christianity in the context of the culture of the High Middle Ages (1050-1350 C.E.). (*On demand*)

RELS 3131. Islam. (3) The development of the traditions in Islam with emphasis on Islamic culture, literature and mysticism. (*Yearly*)

RELS 3134. Studies in Western Religious Thought. (3) Selected works of major religious authors in the West. (*On demand*)

RELS 3135. Religion in Nineteenth-Century America. (3) Examination of religious thought, practices, and movements in 19th-century America. (*On demand*)

RELS 3137. Contemporary African-American Religions. (3) African-American religion since World War II. Emphasis on the influence of religion and religious leaders in the struggle for a Black humanity. (*Alternate years*)

RELS 3150. The Black Church/Civil Rights Movement. (VX) (3) Role of the black church in the struggle for human equality. Topics such as radical, moderate, and accommodationist leadership styles; historical development of the black church in the South; and its emergence as a foundation for modern civil rights movement. (Same as AAAS 3150). (*Fall*)

RELS 3151. Primitive Religions. (3) Religious conceptions of prehistoric humans as found in painting, sculpture, artifacts, burial practices, etc. Two or three selected examples of tribal religion in the modern period. *(On demand)*

RELS 3154. Hinduism. (3) The ancient Vedic traditions and the development of Hinduism. Emphasis is on the role of Hinduism in Indian civilization. (*Alternate years*)

RELS 3157. Buddhism. (3) The historical development of Buddhism with special attention given to its diverse manifestations in South Asia. (*On demand*)

RELS 3160. Tibetan Religion. (3) Prerequisite: RELS 2102 or consent of the instructor. The symbols, beliefs and practices of the Tibetan tradition. The fusion of the ancient native religion and Buddhism. *(On demand)*

RELS 3163. The Religious Art and Architecture of India. (A or X) (3) The visual art of Hindus, Buddhists, Jainas and Muslims in the architecture, paintings and sculptures of India. (*Yearly*)

RELS 3166. Taoism. (3) Philosophical Taoism as nature mysticism. Comparison with nature mystics in the West. (*Alternate years*)

RELS 3169. Zen Buddhism. (3) Prerequisite: RELS 2102 or consent of the instructor. Buddhist origins in India, development of the Ch'an (Zen) school in China and Japan, and emphasis on the formative influences of Zen on Japanese art and culture. (*Alternate years*)

RELS 3172. Religion in Asian Literature. (3) Religious ideas and themes in the literature of Asia. Examples chosen from such literary forms as the novel, the short story, autobiography, drama and poetry. *(On demand)*

RELS 3201. The Meaning of Death. (3) An investigation into the experience of death in the Western tradition. Philosophical, religious, existential, psychological and literary readings clarifying the conceptual problems in our ways of speaking about death. Understanding death as a horizon for understanding life. (Same as PHIL 3201.) (*On demand*)

RELS 3202. The Limits of Language. (3) What it means to be a linguistic creature living in a symbolic world. (*On demand*)

RELS 3206. Images and Experience. (3) The relationship between religious experience and images, as manifested privately (dreams, fantasies, ideals) and publicly (religion, myth, art). *(On demand)*

RELS 3207. Intensive Journal II. (WV) (3) Prerequisites: Junior or Senior standing. Study of religion and holistic depth psychology. Practical experience of the Intensive Journal method concentrates on the inner and spiritual dimension in a life including applications to personal, educational, and professional life. (*Alternate years) (Evenings)*

RELS 3209. Quest in Literature. (3) The spiritual dimension of contemporary and traditional literature. Focus may be on an artist, genre (novel, poetry, drama) or theme. *(On demand)*

RELS 3212. Films and Identity. (WA) (3) Themes of religious identity, alienation, search, discovery, sexuality and death as reflected in recent American movies and foreign films. Film laboratory required. (*On demand*)

RELS 3215. The Artist as Visionary. (3) The role of visual imagination in the development of religious sensibilities. (*Alternate years*)

RELS 3221. Religion and Psychology. (3) Views of the self in relation to traditional religious views, particularly in the works of such people as Freud, Jung, Brown, Erikson, Skinner. *(On demand)*

RELS 3224. Science, Technology and Human Vision. (3) The relationship of science and religion, the place of the individual in a technological society and the visions of the scientific future. *(On demand)*

RELS 3230. Languages of Sacred Texts. (3) Prerequisite: consent of the instructor. The language and literature of a particular religious tradition. Aims at a level of proficiency

to begin reading the sacred writings of a religion in the original language (Koine Greek, Biblical Hebrew, Classical Chinese, Sanskrit). May be repeated for credit when the subject matter changes. (Same as FORL 3050.) *(On demand)*

RELS 3242. Philosophy of Religion. (3) Philosophical implications of religious experience including the definitions, development and diverse forms of the problems of belief and reason in modern thought. (Same as PHIL 3242.) *(On demand)*

RELS 3400. Applied Research/Field Work. (3) Prerequisite: Major or minor in Religious Studies, 9 earned hours in Religious Studies, and permission of the Instructor. Research and in-service training in business or community-based organizations. Specific content based on contract between student, supervising professor and cooperating organization. *(Approximately 120 contact hours for the semester) (On Demand)*

RELS 3600. Senior Seminar. (W) (3) Required of majors in final year of studies. Others may be admitted with consent of the instructor. *(Fall)*

RELS 3800. Independent Studies. (1-3) Prerequisite: consent of the instructor. May be repeated for credit. *(Fall, Spring)*

Undergraduate/Available for Graduate Credit

Additional work required for graduate credit.

RELS 4000 Topics in Religious Studies. (3) (3G) Prerequisite: consent of the instructor. May be repeated for credit. *(On demand)*

RELS 4101. Religion and Modern Thought. (3) (3G) The interaction of modern thought and modern religious sensibilities. *(Alternate years)*

RELS 4201. Religion, Culture and Morality. (3) (3G) (W, X, V) Prerequisite: At least junior standing; one course in religious studies or ethics, or permission of the instructor. International/cross-cultural challenges and consequences of universal religious ethical systems versus religious relativism as the basis for moral theories and practices, including experiences and concerns of under-represented groups within religious moral systems. *(On demand)*

RELS 4204. Life-Study. (WV) (3) (3G) Prerequisites: Junior, senior or graduate standing. An appreciation of the religious dimension in a human life-history. Based on concepts, principles and methods developed by Ira Progoff for working within the life-history of a person who lived in a previous generation. *(Yearly) (Evenings)*

RELS 4205. Intensive Journal. (W, V) (3) (3G) Prerequisites: Junior, senior or graduate standing. Study of religion and holistic depth psychology. Practical experience of the Intensive Journal method concentrates on the outer and creative dimension in a life including applications to personal, educational, and professional life. *(Alternate years) (Evenings)*

RELS 4218. Jung and Religion. (W, L) (3) (3G) Prerequisites: Junior, senior or graduate standing. The works of C.G. Jung as they relate to an understanding of religion and religious experience. Emphasis on his interpretations of myths and symbols as they appear in both Western and non-Western religions. His theories of creativity and the arts, religious expressions and quests for meaning. *(Yearly)*

Graduate and Advanced Undergraduate

RELS 5000. Topics in Religious Studies. (1-3) (1-3G) Prerequisites and credit hours vary with topics. Special topics in Religious Studies. May be repeated for credit as topics vary. *(On demand)*

Graduate Only

RELS 6000. Topics in Religious Studies. (1-3G) Prerequisites and credit hours vary with topics. Advanced topics in Religious Studies. May be repeated for credit as topics vary. *(On demand)*

RELS 6800. Directed Studies. (3G) Prerequisite: consent of the instructor. May be repeated for credit. *(Fall, Spring)*

RESEARCH (RSCH)

Graduate Only

RSCH 6101. Educational Research Methods. (3G) Empirical, logical and conceptual research problems; methods and procedures of research; interpreting research; writing reviews of related literature; library research. *(Fall, Spring, Summer)*

RSCH 6109. Assessment and Evaluation Methods. (3G) Assessment of performance and ability through the selection, administration, and interpretation of standardized and criterion-referenced assessment instruments and mastering of other competencies prescribed by the State of North Carolina and other professional organizational standards. *(Fall, Spring, Summer)*

RSCH 6110. Descriptive and Inferential Statistics in Education. (3G) Prerequisite: RSCH 6101 or equivalent. Objective decision-making in research; inferential methods; elementary parametric and non-parametric techniques in hypothesis testing, data processing through University computer facilities. *(Fall)*

Advanced Graduate Only

RSCH 7110. Applied Research. (3G) Development and implementation of proposals for research; use of designs for research and statistical procedures as required by research plans of graduate students. *(Summer)*

RSCH 7120. Multivariate Statistics. (3G) Prerequisite: RSCH 6110 or equivalent. Multiple regression; factor analysis applied to descriptive, correlational and experimental research. *(Fall)*

RSCH 7196. Program Evaluation Research Methods in Education. (3G) Examination of strategies and techniques of program evaluation with emphasis on the mastery of skills for utilization of selected procedures for analyzing teaching/ learning processes. *(Spring)*

RUSSIAN (RUSS)

Undergraduate

RUSS 1201. Elementary Russian I. (3) Corequisite: RUSS 1201L. Fundamentals of the Russian language, including speaking, listening comprehension, reading, and writing. *(Fall)*

RUSS 1201L. Elementary Russian Practicum I. (1) Corequisite: RUSS 1201. Drill, practice, practical application of structures and concepts learned in class. Two hours per week. *(Fall)*

RUSS 1202. Elementary Russian II. (3) Prerequisites: RUSS 1201 and 1201L. Fundamentals of the Russian language, including speaking, listening comprehension, reading, and writing. *(Spring)*

RUSS 1202L. Elementary Russian Practicum II. (1) Prerequisites: RUSS 1201 and 1201L. Corequisite: 1202. Drill, practice, practical application of structures and concepts learned in class. Two hours per week. *(Spring)*

RUSS 2201. Intermediate Russian I. (4) Prerequisite: RUSS 1202 or permission of the department. Review of grammar, with conversation and composition based upon readings in Russian culture and civilization. Three class hours and two lab hours per week. *(On demand)*

RUSS 2202. Intermediate Russian II. (4) Prerequisite: RUSS 2201 or permission of the department. Continuation of grammar, conversation and composition skills, based on readings in Russian literature. Three class hours and two lab hours per week. *(On demand)*

SECONDARY EDUCATION (SECD)

Undergraduate

SECD 2140. The Adolescent Learner. (3) Characteristics of the adolescent learner, including the impact on the classroom of physical, social, cognitive, moral, vocational and affective development factors and multicultural issues. Field-based activities include observation and tutoring in school and non-school settings; 15 hours of field experiences. *(Fall, Spring)*

SECD 3141. Secondary Schools. (3) Prerequisite: Admission to Teacher Education. Overview of secondary education with emphasis on the foundational components and instructional programs appropriate for contemporary adolescents in American society. Includes 15 hours of field experiences. *(Fall, Spring)*

SECD 3142. Issues in Secondary Education. (2) Prerequisite: Admission to Teacher Education. Corequisites: SPED 3290 and a content methods course. Integration of preservice education and academic concentration course work in a pre-student-teaching field experience. Students choose from sections of the course which focus on a contextual issue of particular interest while working in a setting where the issue exists. Students may take as many different Issues sections as their schedules permit. Includes 30 hours of field experiences. *(Fall, Spring)*

SECD 3441. Student Teaching/Seminar: 9-12 Secondary Science. (15) Prerequisite: Approval of an Application to Student Teaching. A planned sequence of experiences in the student's area of specialization conducted in an approved school setting under the supervision and coordination of a university supervisor and a cooperating teacher in which the student demonstrates the competencies identified for his/her specific teaching field in an appropriate grade-level setting. Approximately 35-40 hours per week in an assigned school setting and 10-12 on-campus seminars scheduled throughout the semester. *(Fall, Spring)*

SECD 3442. Student Teaching/Seminar: 9-12 Secondary Mathematics. (15) Prerequisite: Approval of an Application to Student Teaching. A planned sequence of experiences in the student's area of specialization conducted in an approved school setting under the supervision and coordination of a university supervisor and a cooperating teacher in which the student demonstrates the competencies identified for his/her specific teaching field in a appropriate grade-level setting. Approximately 35-40 hours per week in an assigned school setting and 10-12 on-campus seminars scheduled throughout the semester. *(Fall, Spring)*

SECD 3443. Student Teaching/Seminar: 9-12 Secondary Social Studies. (15) Prerequisite: Approval of an Application to Student Teaching. A planned sequence of experiences in the student's area of specialization conducted in an approved school setting under the supervision and coordination of a university supervisor and a cooperating teacher in which the student demonstrates the competencies identified for his/her specific teaching field in an appropriate grade-level setting. Approximately 35-40 hours per week in an assigned school setting and 10-12 on-campus seminars scheduled throughout the semester. *(Fall, Spring)*

SECD 3444. Student Teaching/Seminar: 9-12 Secondary English (15) Prerequisite: approval of an Application to Student Teaching. A planned sequence of experiences in the student's area of specialization conducted in an approved school setting under the supervision and coordination of a university supervisor and a cooperating teacher in which the student demonstratcs the competencies identified for his/her specific teaching field in an appropriate grade-level setting. Approxiimately 35-40 hours per week in an assigned school setting and 10-12 on-campus seminars scheduled throughout the semester. *(Fall, Spring)*

SECD 3800. Individual Study in Secondary Education. (1-6) Prerequisite: Permission of the student's advisor. Independent study under the supervision of an appropriate faculty member. May be repeated for credit. *(Fall, Spring, Summer)*

Graduate and Advanced Undergraduate

SECD 5000. Topics in Secondary Education. (1-6) (1-6G) May include classroom and/or clinical experiences in the content area. With department approval, may be repeated for credit for different topics. *(Fall, Spring, Summer)*

Graduate Only

SECD 6000. Topics in Secondary Education. May include classroom and/or clinic experiences in the content area. With department approval, may be repeated for credit for different topics. *(Fall, Spring, Summer)*

SECD 6472. Secondary Education Clinical Experience. (3G) Program of learning activities in the student's area of academic concentration in an approved secondary school setting. *(On demand)*

SECD 6475. Secondary Internship and Seminar. (3-6G) Supervised clinical activities to develop and assess the student's ability to observe, analyze and recommend changes for curriculum and instruction in the secondary classroom. *(Fall, Spring)*

SECD 6800. Individual Study in Secondary Education. (1-6G) Prerequisite: Permission of the student's adviser. Independent study under the supervision of an appropriate faculty member. May be repeated for credit. *(Fall, Spring, Summer)*

SECD 7999. Graduate Residence. (0G) Meets Graduate School requirement for continuous enrollment during completion of a capstone project or comprehensive examination. *(Fall, Spring)*

SOCIOLOGY (SOCY)

Undergraduate

SOCY 1101. Introduction to Sociology. (VC) (3) The sociological perspective and process; fundamental concepts, principles and procedures. *(Fall, Spring, Summer) (Evenings)*

SOCY 2090. Topics in Sociology. (1-3) Prerequisite: SOCY 1101. Examination of specialized topics. May be repeated for credit as topics vary. *(On demand)*

SOCY 2112. Popular Culture. (VC) (3) Analysis of popular forms of everyday life in America: fashions, fads, entertainment trends, advertising, television programming, music, myths, stereotypes and icons of mass-mediated culture. *(Fall, Spring)*

SOCY 2132. Marriage and the Family. (VC) (3) Prerequisite: SOCY 1101. Cross-cultural examination of family; socialization and sex roles; love, dating, and mate selection; communication; sexuality; power and decision making; parenthood; childlessness; conflict and violence; divorce, remarriage and stepfamilies; alternate lifestyles; and future family. *(Fall, Spring, Summer) (Evenings)*

SOCY 2163. Sociology of Gender. (3) Prerequisite: SOCY 1101 or consent of the instructor. Changing patterns of gender inequality; socialization and social structure as basis of gendered behavior, ideologies, and relationships. Alternative gender models and social movements as vehicles to diminishing gender inequality. *(Yearly)*

SOCY 2171. Social Problems. (3) Contemporary social problems and consequences for American society. *(Fall, Spring, Summer) (Evenings)*

SOCY 3110. American Minority Groups. (3) Prerequisite: SOCY 1101. Relations between dominant and minority groups; the establishment, maintenance and decline of dominance involving racial, ethnic and religious minorities. *(Fall, Spring)*

SOCY 3132. Sociology of Sport. (3) Prerequisite: SOCY 1101 or consent of instructor. Dynamics and emergence of sport; reciprocal influence between sport and society; values, norms, and roles in sports. *(Yearly)*

SOCY 3143. Social Movements. (3) Prerequisite: SOCY 1101. Analysis of collective behavior, ideology, development and organizations of movements seeking or resisting change. *(Yearly)*

SOCY 3153. Evolution of Sociological Theory. (3) Prerequisite: SOCY 1101. Origins and evolution of fundamental sociological concepts and theories. *(Fall, Spring)*

SOCY 3161. Socialization and Society. (3) Prerequisite: SOCY 1101. Analysis and process of socialization, social interaction, sociocultural dimension of personality. *(Yearly)*

SOCY 3173. Criminology. (3) Prerequisite: SOCY 1101. Nature and historical development of crime and political-economic organization of crime, criminal law, theories of crime causation. *(Yearly)*

SOCY 3175. Crowds, Riots, and Disasters. (3) Prerequisite: SOCY 1101. Collective behavior in everyday life; crowds, rumors, fads, fashion; and collective behavior that disrupts social order; riots and responses to disaster; response of individuals, organizations and communities to natural disasters, e.g., floods, hurricanes, tornados, and earthquakes. *(Yearly)*

SOCY 3261. Human Sexuality. (3) Prerequisite: SOCY 1101 or consent of instructor. Human sexuality research; teenage pregnancy; birth control; sex education; sexual fantasy; pornography; homosexuality and bisexuality; sexual communication; heterosexual alternatives. *(Fall, Spring, Summer)*

SOCY 3656. Seminar in Sociological Research. (W) (3) (3G) Prerequisite: completion of all other required core courses. Development, analysis, and presentation of independent research project. Review of other research projects. *(Spring)*

SOCY 3895. Directed Individual Study. (1-4) Prerequisite: consent of the instructor. Supervised investigation of a special problem. May be repeated for credit. *(Fall, Spring, Summer)*

Undergraduate/Available for Graduate Credit
Additional work required for graduate credit.

SOCY 4090. Topics in Sociology. (1-3) (1-3G) Prerequisite: SOCY 1101. Examination of specialized sociological topics. May be repeated for credit. (A listing and brief description of specific courses offered each term is available from the departmental office.) Examples: corporate crime, divorce, mental health, Japan, Eastern Europe; sociology of religion. *(On demand)*

SOCY 4110. Sociology of Aging. (3) (3G) Prerequisite: SOCY 1101 or consent of the instructor. Study of the changing characteristics, aspirations and needs of older adults and their impact upon such institutions as the family, work, the economy, politics, education, and health care; emphasis on sociological theories of aging, contemporary research, and the analysis of specific aging policies and programs. (Same as GRNT 4110) *(Fall)*

SOCY 4111. Social Inequality. (3) (3G) Prerequisite: SOCY 1101. Distribution of power, privilege and prestige; correlates and consequences of inequality; national and international comparisons. (*Yearly*)

SOCY 4112. Sociology of Work. (3) (3G) Prerequisite: SOCY 1101 or consent of instructor. The emergence of industrialization; its technology and impact on work, community and family; problems and contemporary trends in selected industrial societies. Additional work will be required of all graduate students. (*On demand*)

SOCY 4115. Sociology of Corporations. (3) (3G) Prerequisite: SOCY 1101. Structure and dynamics of complex organizations; bureaucracy; mechanisms of change. (*Yearly*)

SOCY 4124. Sociology of the Community. (3) (3G) Prerequisite: SOCY 1101. Concepts and methods of community analysis of planned and unplanned community change. (*On demand*)

SOCY 4125. Urban Sociology. (3) (3G) Prerequisite: SOCY 1101 or consent of the instructor. Cross Cultural analysis of urban development, social structure, ecology, demographic composition, and social problems. (*Yearly*)

SOCY 4130. Sociology of Health and Illness. (3) (3G) Prerequisite: SOCY 1101 or consent of instructor. Impact of social factors on health and illness; health care occupations; organization and financing of health care; international comparisons; prospects for the future. Graduate students required to do additional readings and/or research. (*Yearly*)

SOCY 4131. Family Policy. (3) (3G) Critical analysis of four aspects of family policy: the historical and cultural factors that have resulted in specific policies affecting the family; the specification of contemporary family policy at both the national and state level; the intended and actual application of existing family policy; and the implications and impact of policies as they are interpreted and implemented. Graduate students required to complete a more extensive final paper. *(On demand)*

SOCY 4134. Families and Aging. (3) (3G) Theories explaining the formation and functioning of American families with emphasis on the impact of the aging of society. Examination of the current demographic trends and expectations of multigenerational families as well as the future demands and modifications. Graduate students required to complete a more extensive final paper. *(On demand)*

SOCY 4135. Sociology of Education. (3) (3G) Prerequisite: SOCY 1101 or consent of the instructor. Educational institution; the school class as a social system; the school as a social environment and a complex organization. (*Yearly*)

SOCY 4150. Older Individual and Society. (3) (3G) Review of the theories explaining the formation and functioning of American families with emphasis on the impact of the aging of society. Examination of the current demographic trends and expectations of multigenerational families as well as the future demands and modifications. Graduate students required to complete a more extensive final paper. *(Yearly)*

SOCY 4154. Contemporary Social Theory. (3) (3G) Prerequisite: SOCY 3153 or consent of instructor. Elements and process of theory construction; contemporary social theories such as theories of social order and causation, power, class structure and inequality; group process theories; post-modern theories. (*On demand*)

SOCY 4155. Sociological Research Methods. (4) (4G) Prerequisite: SOCY 3153 or consent of instructor. Formulation of research problems; research designs; social measurement; sampling; collection, analysis and interpretation of data. Three hours of lecture/discussion and completion of weekly laboratory units. (*Fall, Spring*)

SOCY 4156. Quantitative Analysis. (4) (4G) Prerequisites: SOCY 4155 or consent of department. Concepts and procedures of sociological analysis; data processing; measurement theory; quantitative models of analysis. Three hours of lecture/discussion and completion of weekly laboratory units. (*Fall, Spring*)

SOCY 4172. Sociology of Deviant Behavior. (3) (3G) Prerequisite: SOCY 1101. An examination of the social processes producing unusual, bizarre and condemned behavior. (*Fall, Spring) (Evenings*)

SOCY 4263. Sociology of Small Groups. (3) (3G) Prerequisite: SOCY 1101 or consent of instructor. Systematic analysis and application of theoretical and empirical research pertaining to small groups. (*On demand*)

SOCY 4480. Internship in Society. (3-6) (3-6G) Prerequisite: consent of the department. Research and/or in-service training for selected students in cooperating community organizationns. Specified content based upon a contract between student, department, and community organization. May be repeated for credit up to six semester hours. Offered only on a *Pass/No Credit* basis. *(Fall, Spring, Summer)*

SOCY 4632. Changing American Family. (3) (3G) Prerequisites: SOCY 1101 and 2132, or consent of instructor. Family theories; family system in relation to other social systems; integration of marital, parental and occupational roles in context of changing socioeconomic influences; traditional versus contemporary family roles; breakdown in stable family functioning. (*Fall*) (*Evenings*)

Graduate and Advanced Undergraduate

SOCY 5151. Pro-seminar: Social Problems and Social Policy. (3) (3G). Prerequisite: graduate student in sociology or senior sociology major. Introduction to applied sociology, proposal writing and grantsmanship,

professional ethics and professional socialization. Overview of major research areas in applied sociology. *(Fall)*

SOCY 5631. Seminar in Family Violence. (3) (3G) Prerequisite: senior, graduate student or consent of the instructor. Family violence in the context of a changing society and family system. Principal foci: child abuse, sexual abuse, spouse abuse; other forms of family violence. Investigation of these topics in terms of sociocultural influences and the internal dynamics of families. *(Spring) (Evenings)*

Graduate Only
SOCY 6090. Topics in Sociology. (3G) Prerequisite: consent of department. Intensive treatment of a topic or survey of related topics, depending on student needs and interests. May be repeated for credit as topics vary. *(On demand)*

SOCY 6130. Sociology of Aging: Theories and Research. (3G) Application of stratification theories and demography are applied to the older population. Issues of race, gender, socio-economic status, age, and geographic distribution are examined to investigate the diversity of the older age group and their access to resources. *(Yearly)*

SOCY 6135. Social Context of Schooling. (3G) The political economy of schooling; race, class, and gender effects on educational processes and outcomes; the school as a complex organization; the sociology of school reform movements. *(Fall)*

SOCY 6136. Qualitative Research Methods. (3G) Collection and analysis of qualitative date including use of grounded theory and a variety of qualitative techniques, consideration of ethical issues and the use of data. *(Alternative years)*

SOCY 6614. Self and Society. (3G) Examination of theoretical constructs and substantive concerns relevant to the socialization process; comparison of symbolic interactionism, ethnomethodology, phenomenology; emphasis on social construction of reality in various "social worlds" (deviant, work, family). *(Alternate years)*

SOCY 6615. Dilemmas in Organizations. (3G) Examines organizational theory and research focused on organizational behavior, inter-organizational relations, relations with external stakeholders and organizational culture. Case study analysis, group-problem solving and the study of concrete organizational dilemmas. *(Fall)*

SOCY 6616. Stratification and Inequality. (3G) Examination of theories of stratification and the causes, processes and social consequences of economic and political inequality; assumptions behind, mechanisms for, and consequences of government and private sector strategies to address problems associated with inequality. *(Alternate years)*

SOCY 6617. Data Utilization. (3G) Methodological and statistical strategies for applied sociological research within organizational settings; selecting the best strategies consistent with budgetary, manpower and organizational constraints; interpreting and communicating research results in ways understandable to and useful for organizational decision-makers. *(Alternate years)*

SOCY 6651. Social Theory. (3G) Analysis of contemporary social theories, with emphasis on their implications for planned change. *(Yearly)*

SOCY 6652. Issues in Social Research. (3G) Examination of epistemology of social research; assumptions and methods of specific research strategies; ethical and policy issues of applied and academic research. *(Alternate years)*

SOCY 6653. Advanced Quantitative Analysis. (3G) Prerequisites: six hours in Introductory Statistics and/or Research Methods. Contemporary techniques of data analysis, management and processing applied to specific topics; measurement models, data reduction strategies and multivariate procedures. *(Alternate years)*

SOCY 6895. Tutorial in Sociology. (1-4G) Prerequisite: permission of instructor. Directed reading and/or research; development of expertise in substantive area. May be repeated for credit. *(Fall, Spring, Summer)*

SOCY 6897. Research Practicum. (I-6G). Prerequisite: SOCY 6651 and 6652. Preparation of research paper based upon research completed within a community organization or agency. The student will develop a consultant-client relationship with the agency or organization and conduct a research/evaluation project on behalf of the agency or organization (such as a needs assessment, program evaluation, social impact assessment or policy analysis. *(Fall, Spring)*

SOCY 6996. Thesis. (1-6G) Prerequisites: completion of all other coursework and admission to candidacy by Graduate Committee. Applied, academic, or theoretical research project, defended before graduate faculty. May be repeated for credit up to six hours. *(Fall, Spring, Summer)*

SOCY 7999 Graduate Residence. (0G) Continuation of individual thesis project. *(Fall, Spring)*

SOCIAL WORK (SOWK)

Undergraduate
SOWK 1101 . The Field of Social Work. (3) Development and philosophy of social work as a profession; personal and societal needs; methods and organizational arrangements; roles and tasks of social workers. *(Fall, Spring, Summer)*

SOWK 2182. Human Behavior and the Social Environment I. (3) Prerequisite: BIOL 1110, SOCY 1101, and PSYC 1101. Prerequisite or corequisite: SOWK 1101. Transitional and developmental patterns of the individual. *(Fall)*

SOWK 2183. Human Behavior and the Social Environment II. (3) Prerequisite: SOWK 2182. Interaction between the individual, family, community and larger social system; individual problem solving; delivery of social services; impact of racism, sexism, poverty, ethnicity, and social class. *(Spring)*

SOWK 3090. Topics in Social Work. (1-3) Specialized topics in social work. May be repeated for credit as topics vary. (A listing and brief description of specific courses offered each term is available from the departmental office.) (*Fall, Spring*)

SOWK 3100. Social Work Research (3). Prerequisite: SOWK 2182 and Goal II courses. Introduction to practice and program evaluation and other research methods and skills needed by a social worker. *(Fall, Spring)*

SOWK 3181. Social Work Methods I. (3) Prerequisite: SOWK 2183. Overview of problem solving approach in general, and work with individuals in particular. (*Fall*)

SOWK 3182. Social Work Methods II. (3) Prerequisite: SOWK 3181. Work with families and groups. (*Spring*)

SOWK 3184. Social Work Methods III. (3) Prerequisite: SOWK 3181. Work with communities and organizations. (*Spring*)

SOWK 3201. Foundations of Social Welfare. (W) (3) Prerequisite: SOWK 2183 and POLS 1110. Foundations of social welfare; issues, processes, values and conflicts which influence social welfare programming. (*Fall*)

SOWK 3202. Social Welfare Policy. (3) Prerequisite: SOWK 3201. Nature and development of social welfare policy; implications of policy for program design and service delivery; role of the social worker in developing and implementing social welfare policies. (*Spring*)

SOWK 3482. Social Work Field Placement I. (6) Prerequisites: All other SOWK requirements. Corequisite: SOWK 3683. Directed field experience under professional supervision in selected community agencies. Offered only on a *Pass/No Credit* basis. (*Fall, Spring, Summer*)

SOWK 3484. Social Work Field Placement II. (6) Prerequisite: SOWK 3482. Corequisite: SOWK 3685. A continuation of SOWK 3482. Offered only on a *Pass/No Credit* basis. (*Fall, Spring, Summer*)

SOWK 3683. Social Work Field Placement Seminar I. (1) Corequisite: SOWK 3482. Analysis and discussion of student field experience. (*Fall, Spring, Summer*)

SOWK 3685. Social Work Field Placement Seminar II. (1) Corequisite: SOWK 3484. A continuation of SOWK 3683. (*Fall, Spring, Summer*)

SOWK 3895. Directed Individual Study. (1-4) Prerequisite: consent of the department. Supervised investigation of a special problem. May be repeated for credit. (*Fall, Spring, Summer*)

Undergraduate/Available for Graduate Credit

SOWK 4100. Ethnicity and Aging. (3) (3G) Prerequisite: consent of the instructor. Examines the changing characteristics, goals and needs of older African-Americans, Asian-Americans, Native Americans and Hispanics. Provides a diversity of perspectives from which to view the relationship of ethnicity to aging including the impact of the family, work, education, economy, illness behavior and health care. (*On demand*)

SOWK 4101. Social Work Practice With the Elderly. (3) (3G) Prerequisite: consent of the department. Continuum of care for the elderly. Psychosocial assessment, treatment/intervention planning and implementation. Approached from eclectic clinical social work perspective with particular emphasis on psychosocial systems, family and group treatment modalities. (*On demand*)

SPANISH (SPAN)

Undergraduate

SPAN 1100. Elementary Spanish I. (3) Prerequisite: may be taken *only* by students with no previous experience in Spanish. First course in a college-level sequence to develop communicative competence in speaking, understanding, reading, and writing Spanish, in a cultural context. (*Fall, Spring, Summer) (Evenings*)

SPAN 1101. Elementary Spanish II. (3) Prerequisite: SPAN 1100 or equivalent. Second course in a college-level sequence to develop competence in speaking, understanding, reading and writing Spanish, in a cultural context. The first course offered for students with previous experience in Spanish. *(Fall, Spring, Summer) (Evenings)*

SPAN 1102. Elementary Spanish III. (3) Prerequisite: SPAN 1101 or equivalent. Third course in a college-level sequence to develop competence in speaking, understanding, reading, and writing Spanish, in a cultural context. *(Fall, Spring, Summer) (Evenings)*

SPAN 2009. Hispanic Literature in English Translation. (WL) (3) Studies of Spanish or Spanish American literature in translation. Not applicable toward Spanish major. May be repeated for credit as topics vary. Course conducted in English. (*On demand*)

SPAN 2050. Topics in Spanish. (1-3) Prerequisite: SPAN 2201 or permission of the department. Study of a particular facet of the Spanish language, culture or literature. May be repeated for credit as topics vary. (*On demand*)

SPAN 2201. Intermediate Spanish I. (3) Prerequisite: SPAN 1102 or equivalent. Review of grammar, reinforcement and expansion of competence in speaking, understanding, reading, and writing, in a cultural context. *(Fall, Spring)*

SPAN 2202. Intermediate Spanish. (3) Prerequisite: SPAN 2201 or permission of the department. Extensive practice in oral and written control of the language on basis of readings from Spanish or Spanish American literature. (*Fall, Spring*)

SPAN 2210. Business Spanish. (3) Prerequisite: SPAN 2201 or equivalent. Introduction to the spoken and written language of the Hispanic business community. Acquisition and use of managerial, financial and commercial terminology. (Alternate to SPAN 2202.) *(On demand)*

SPAN 2211. Spanish for Criminal Justice Professionals. (3) Prerequisite: SPAN 2201 or permission of the department. Spoken and written Spanish for ciminal justice professionals. *(Fall)*

SPAN 2212. Spanish for Health Care Professionals. (3) Prerequisite: SPAN 2201 or permission of the department. Spoken and written Spanish for health care professionals. *(Spring)*

SPAN 3009. Masterpieces of Hispanic Literature in English Translation. (3) Prerequisites: sophomore standing and ENGL 1102. Advanced studies of Spanish or Spanish-American literature in English translation. Not applicable toward a Spanish major. May be repeated for credit as topics vary. Course conducted in English. *(On demand)*

SPAN 3019. Hispanic Women Writers in English Translation. (WL or WX) (3) Prerequisite: ENGL 1102 and sophomore standing, or permission of instructor. Examination of prose and poetry by women writers from Spain and the Americas to understand women's voices and other cultures. Conducted in English. Knowledge of Spanish not required. Not applicable toward Spanish major. *(On demand)*

SPAN 3201. Advanced Grammar and Composition. (3) Prerequisite: SPAN 2202 or permission of the department. Intensive oral and written work in Spanish. *(Fall)*

SPAN 3202. Advanced Conversation and Composition. (3) Prerequisite: SPAN 2202 or permission of the department. Intensive oral and written work in the language. Reports on collateral readings. *(Spring)*

SPAN 3203. Introduction to Spanish Literature. (3) Prerequisite: SPAN 2202 or permission of the department. Reading and analysis of representative master works of Spanish literature from its origins through the 20th century. *(Alternate semesters)*

SPAN 3209. Spanish Civilization and Culture. (3) Prerequisite: SPAN 2202 or permission of the department. An overview of the cultural heritage of peninsular Spain. *(Alternate semesters)*

SPAN 3210. Spanish American Civilization and Culture. (3) Prerequisite: SPAN 2202 or permission of department. Introduction to the cultural heritage of Spanish America. *(Alternate semesters)*

SPAN 3212. Introduction to Spanish American Literature. (3) Prerequisite: SPAN 2202 or permission of the department. Introduction to studies in Spanish American literature from the 16th century through the contemporary period. *(Alternate semesters)*

SPAN 3231. Spanish Phonetics. (3) Prerequisite: SPAN 2202 or permission of the department. Detailed analysis of description and production of Spanish sounds. Practical exercises include phonetic transcription and recordings. Two class hours and two lab hours per week. *(On demand)*

SPAN 3800. Directed Individual Study. (1-3) Prerequisite: permission of the department; normally open only to FL majors and minors. Individual work on a selected area of study. To be arranged with the instructor, during the preceding semester. By special permission only. May be repeated for credit. *(On demand)*

Undergraduate/Available for Graduate Credit

Additional work required for graduate credit.

SPAN 4050. Selected Topics in Spanish. (1-2-3) (1-2-3G) Prerequisites: two 3000-level courses or permission of the department. Consideration of a predetermined topic. May be repeated for credit as topics vary. *(On demand)*

SPAN 4201. Nineteenth-Century Spanish Literature. (3) (3G) Prerequisites: two 3000-level courses or permission of the department. Survey of peninsular literature from Costumbrismo through the Generation of 1898. Lectures, discussions, and reports. *(Alternate years)*

SPAN 4202. Twentieth-Century Spanish Literature. (3) (3G) Prerequisites: two 3000-level courses or permission of the department. Treatment of major literary developments from the Generation of 1898 to present day. Lectures, discussions, and reports. *(Alternate years)*

SPAN 4205. Novel of the Golden Age. (3) (3G) Prerequisites: two 3000-level courses or permission of the department. *El Lazarillo* through *El Criticón*. Lectures, discussions, and reports. *(Alternate years)*

SPAN 4206. Theater of the Golden Age. (3) (3G) Prerequisites: two 3000-level courses or permission of the department. Study of works of the leading dramatists of the period. Lectures, discussions and reports. *(Alternate years)*

SPAN 4210. Studies in Spanish American Poetry. (3) (3G) Prerequisites: two 3000-level courses or permission of the department. Studies of 19th- and 20th-century Spanish American poetry. *(Alternate years)*

SPAN 4211. Studies in Spanish American Prose Fiction. (3) (3G) Prerequisites: two 3000-level courses or permission of the department. Studies of 19th- and 20th-century Spanish American prose fiction. *(Alternate years)*

SPAN 4212. Studies in Spanish American Theater. (3) (3G) Prerequisites: two 3000-level courses or permission of the department. Studies of 20th-century Spanish American theater. *(On demand)*

SPAN 4213. Don Quijote. (3) (3G) Prerequisites: two 3000-level Spanish courses or permission of the department. Study of Cervantes' masterpiece. *(On demand)*

SPAN 4800. Directed Individual Study. (1-3) (1-3G) Prerequisite: permission of the department; normally open only to FL majors and minors. Individual work on a selected area of study. To be arranged with the instructor, generally during the preceding semester. By special permission only. May be repeated for credit. *(On demand)*

SPECIAL EDUCATION (SPED)

Undergraduate

SPED 2100. Introduction to Students with Special Needs. (2) Corequisite: EDUC 2100. Characteristics of students with special learning needs, including those who are gifted and those who experience academic, social, emotional, physical and developmental disabilities. Legal, historical, and philosophical foundations of special education and current issues in providing appropriate educational services to students with special needs. Field-based activity required. *(Fall, Spring, Summer)*

SPED 3171. Education of Learners with Mental Handicaps. (3) Prerequisite: Admission to Teacher Education. Overview of learner characteristics and continuum of educational services for students who are mentally handicapped. Focus on curriculum models of remedial, compensatory, and life skills instruction, interaction with general education curriculum, and curricular decision-making. *(Fall)*

SPED 3172. Directed Readings in Special Education Research. (3) Prerequisite: Admission to Teacher Education. lntroduces fundamental educational research procedures, critical evaluations of published research, identification of instructional implications of published research, and ethical issues in research and practice. *(Fall)*

SPED 3173. Special Education Assessment. (3) Fundamental concepts in educational assessment of exceptional students with emphasis on the referral-to-placement process in special education including multidisciplinary team roles and the development of lndividualized Education Programs (lEPs). Requires two hours of field-based assignments each week. *(Fall)*

SPED 3174. Classroom-Based Assessment. (3) Prerequisites: Admission to Teacher Education, SPED 3171 and SPED 3173. Classroom assessments for use by special educators in dientifying instructional needs, planning instruction modifying instruction and monitoring programs across content areas. Approximately 20 hours of field experiences. *(Spring)*

SPED 3272. Teaching Mathematics to Learners with Mental Handicaps. (3) Prerequisite: Admission to Teacher Education. Strategies, techniques, and activities to teach functional mathematics to students with mental handicaps and other mild disabilities. Assessment issues, an exploration of developmental, remedial, and functional mathematics, curricular modifications, and functional applications. Requires two hours of field-based work in schools each week. *(Fall)*

SPED 3273. Teaching Life Skills to Learners with Mental Handicaps. (3) Prerequisites: Admission to Teacher Education. Methods and materials for teaching functional skills in daily living, social, and vocational domains that will enable persons with mental handicaps to live independently in their communities. Requires two hours of field-based assignments in schools each week. *(Fall, Spring)*

SPED 3290. Modifying Instruction for Learners with Diverse Needs. (2) Prerequisite: Admission to Teacher Education. Corequisite: Enrollment in methods course(s) with field experience requirement. Strategies for adapting standard instruction to meet the learning needs of all members of elementary, middle, or secondary classrooms, including students at risk for school failure, individuals from culturally and linguistically diverse backgrounds, gifted learners, and students with disabilities. *(Fall, Spring)*

SPED 3470. Student Teaching/Seminar: K-12 Special Education: Mental Handicaps. (15) Prerequisites: Approval of an Application to Student Teaching. A planned sequence of experiences in the student's area of specialization conducted in an approved school setting under the supervision and coordination of a university supervisor and cooperating teacher requiring demonstration of the competencies identified for the student's specific teaching field in an appropriate grade level setting. Requires approximately 35-40 hours per week in an assigned school setting and 10-12 on-campus seminars scheduled throughout the semester. *(Fall, Spring)*

SPED 3800. Individual Study in Special Education. (1-6) Prerequisite: Permission of the student's advisor. lndependent study under the supervision of an appropriate faculty member. May be repeated for credit. *(Fall, Spring, Summer)*

Undergraduate/Available for Graduate Credit

SPED 4110. Assessment in Special Education: Preschool. (3) (3G) Strategies for interdisciplinary educational assessment to identify needs and plan appropriate programs for young children with disabilities and their families. Approximately 20 hours of field experiences. *(Fall)*

SPED 4111. Issues in Preschool Education for Children with Disabilities. (3) (3G) Current issues and trends in early intervention and preschool services for young children with disabilities and their families. lncludes field trips scheduled throughout the semester. *(Fall)*

SPED 4170. Special Education Consultation and Collaboration. (3) (3G) Prerequisite: Admission to Teacher Education or graduate standing. Methods for multidisciplinary planning, co-teaching with general educators in inclusive settings, utilizing paraeducators effectively, working with parents of exceptional students, and building collaborative interagency services for students with disabilities. *(Fall, Spring)*

SPED 4210. Instructional Methods and Materials: The Early Years. (3) (3G) Goal-setting, instructional design, and strategies for teaching young children with disabilities and their families. Includes a field-based assignment of approximately 20 hours. *(Spring)*

SPED 4270. Classroom Management. (3) (3G) Prerequisite: Admission to Teacher Education or graduate standing. Theoretical context and related applied strategies necessary to manage effectively the classroom behaviors of individuals or groups of students. Requires a field-based assignment of approximately 10 hours. *(Fall, Spring)*

SPED 4276. Teaching Language Arts to Learners with Mental Handicaps. (3) (3G) Prerequisites: Admission to Teacher Education, SPED 3171, SPED 3173, and READ 3225 or graduate standing. Knowledge and practice in remediating language arts deficits and sound developmental instruction for learners who are mentally handicapped. Approximately 20 hours of field experiences. *(Spring)*

Graduate and Advanced Undergraduate

SPED 5000. Topics in Special Education. (1-6) (1-6G) May include classroom and/or clincical experiences in the content area. With department approval, may be repeated for credit for different topics. *(Fall, Spring, Summer)*

SPED 5111. Introduction to Supported Employment. (3) (3G) Introduction to the concept of supported employment including models of supported employment, social skills in the workplace, assessment and importance of independent living skills. Additional work required for graduate credit. *(Fall)*

SPED 5121. Supported Employment Methods. (3) (3G) Prerequisite: SPED 5111. Examination of curriculum guidelines for successful supported employment programs, norm-referenced and criterion-referenced assessment, independent living skills, and social skills in the workplace. Additional work required for graduate credit. *(Spring)*

SPED 5151. Interagency Collaboration. (3) (3G) Prerequisites: SPED 5111 and 5121. Analysis of existing interagency agreements and practicum experiences with individuals from agencies providing supported employment or transition services. Additional work required for graduate credit. *(Fall, Spring, Summer)*

Graduate Only

SPED 6000. Topics in Special Education. (1-6G) May include classroom and/or clinic experiences in the content area. With department approval, may be repeated for credit for different topics. *(Fall, Spring, Summer)*

SPED 6100. Introduction to Special Education. (3G) Examination of the historical antecedents of contemporary practices in the field of special education with emphasis on the conceptual models of child variance and current trends in the field of education. *(Fall, Spring, Summer)*

SPED 6111. The Gifted and Talented. (3G) Examination of the historical and philosophical perspectives of education for students who are academically or intellectually gifted with emphasis on identification procedures, creativity, laws/policies, and current research in the field of giftedness. *(Fall, Summer)*

SPED 6112. Learning Disabilities. (3G) Examination of learning disabilities with emphasis on theories, issues, current trends and definitions of learning disabilities as well as instructional strategies, program models and major contributions to the field. *(Fall, Summer)*

SPED 6113. Mental Handicaps. (3G) Examination of historical antecedents, major contributors, current practices, issues and trends in the field of mental retardation. *(Spring)*

SPED 6114. Emotional Handicaps. (3G) Examination of the conceptual models of emotional disturbance with emphasis on operational models and current practices based on the constructs of the models. Consideration of administrative arrangements for programs for children with emotional behavior. *(Spring)*

SPED 6115. Mild Handicapping Conditions. (3G) Examination of theories and practice of cross-categorical programming, with emphasis on theories, issues, current trends, current practices, and consultation practices. *(On demand)*

SPED 6116. Career and Vocational Techniques. (3G) Methods and procedures used in preparing students with disabilities for the world of work and independence are studied. *(Fall)*

SPED 6117. Introduction to Persons with Severe Handicaps. (3G) Social and cultural antecedents to contemporary services for persons with severe disabilities and the needs of these individuals within a developmental framework. *(Fall)*

SPED 6121. Methods and Materials: Mental Handicaps. (3G) Examination of the principles and practices of curriculum development and modification and current instructional methodologies for learners with mental handicaps. *(Fall)*

SPED 6122. Methods and Materials: Emotional Handicaps. (3G) Planning, implementation and evaluation of special education classrooms with emphasis on curriculum models, behavioral and academic strategies and individualized instruction for learners with emotional handicaps. *(Fall)*

SPED 6123. Methods and Materials: Learning Disabilities. (3G) Planning, implementation, and evaluation of instructional programs with emphasis on individual instruction, grouping for instruction, consultation, assessment, and program planning for learners with learning disabilities. *(Spring)*

SPED 6124. Methods of Instruction for the Gifted. (3G) Prerequisites: SPED 6111, RSCH 6109. Planning, implementing, and evaluating instructional procedures appropriate for gifted learners. *(Fall)*

SPED 6125. Instructional Practices: Cross-Categorical. (3G) Assessment procedures appropriate for use with students who are mildly disabled. Assessment information will be used to plan for the most appropriate instruction for students with mild disabilities receiving education in a cross-categorical setting. *(On demand)*

SPED 6126. Methods for Teaching Persons with Severe Handicaps. (3G) Corequisite: SPED 6127. Principles and procedures used to program instruction for persons who have severe disabilities. Students are required to design and implement an instructional program. *(Spring)*

SPED 6127. Curriculum for Persons with Severe Handicaps. (3G) Corequisite: SPED 6126. Selection of

instructional programs appropriate for use with persons with severe disabilities. The student identifies strengths and weaknesses of educational programs and makes recommendations for their use with those persons. *(Spring)*

SPED 6130. Diagnostic Instruction. (3G) Principles and practice of educational problem solving with emphasis on formal assessment and linkages between assessment and instruction. *(Fall, Spring)*

SPED 6254. Individualizing Instruction for Regular and Special Needs Students. (3G) Prerequisites: Completion of core courses and area specialization. Instructional methods, materials, classroom management, and assessment to provide individualized instruction for special needs students. *(Spring)*

SPED 6470. Special Education Clinical Experience. (3G) Prerequisite: Permission of department. Program of experiential learning activities in the student's level and/or area of academic concentration in an approved school setting. *(Fall, Spring)*

SPED 6471. Internship: Gifted and Talented. (3-6G) Prerequisite: Approval of department. Supervised experiences in observation, instruction and administration of programs for academically or intellectually gifted learners. Offered only on a Pass/No Credit grading. *(Spring)*

SPED 6472. Internship: Learning Disabilities. (3-6G) Prerequisite: Approval of department. Supervised experiences in observation, instruction and administration of programs for students with learning disabilities. Offered only on a Pass/No Credit grading. *(Fall, Spring)*

SPED 6473. Internship: Emotional Handicaps. (3-6G) Prerequisite: Approval of department. Supervised experiences in observation, instruction and administration of programs for students with emotional handicaps. Pass/No Credit grading. *(Fall, Spring)*

SPED 6474. Internship: Mental Handicaps. (3-6G) Prerequisite: Approval of department. Supervised experiences in observation, instruction and administration of programs for students who have mental handicaps. Offered only on a Pass/No Credit grading. *(Fall, Spring)*

SPED 6475. Internship: Mild Handicaps. (3-6G) Prerequisite: Approval of department. Supervised experiences in observation, instruction and administration of programs for students who have special needs. Offered only on a Pass/No Credit grading. *(Fall, Spring)*

SPED 6630. Problems and Issues of Persons with Severe Handicaps. (3G) Issues, trends and practices in the education of persons with severe disabilities which master teachers and supervisors may encounter with this population. *(Fall)*

SPED 6640. Seminar in Special Education: Working with Families. (3G) Examination of current issues and trends related to special education program planning and instruction. *(On demand)*

SPED 6641. Seminar in Curriculum Development: Gifted and Talented. (3G) Procedures and suggestions for developing programs for academically or intellectually gifted learners; philosophy of the teacher; school and community assumptions of curriculum; child characteristics; parental concerns; teaching styles. *(Spring)*

SPED 6800. Individual Study in Special Education. (1-6G) Prerequisite: Permission of the student's adviser. Independent study under the supervision of an appropriate faculty member. May be repeated for credit. *(Fall, Spring, Summer)*

Advanced Graduate Only
SPED 7999. Graduate Residence. (0G) Meets Graduate School requirement for continuous enrollment during completion of a capstone project or comprehensive examination. *(Fall, Spring)*

STATISTICS (STAT)

All STAT/MATH/OPRS courses offered by the Department of Mathematics are approved to satisfy requirements for the Problem Solving Goal of UNC Charlotte Education.

Undergraduate
STAT 1220. Elements of Statistics I (BUSN). (3) Prerequisite: MATH 1100 or placement by the department. Noncalculus based introduction to data summarization, discrete and continuous random variables (e.g., binomial, normal), sampling, central limit theorem, estimation, testing hypotheses and linear regression. Applications of theory will be drawn from areas related to business. May not be taken for credit if credit has been received for STAT 1221 or 1222. *(Fall, Spring, Summer) (Evenings)*

STAT 1221. Elements of Statistics I (BIOL). (3) Prerequisite: MATH 1100 or placement by the department. Same topics as STAT 1220 with special emphasis on applications to the life sciences. May not be taken for credit if credit has been received for STAT 1220 or 1222. *(Fall, Spring)*

STAT 1222. Elements of Statistics I (SBS). (3) Prerequisite: MATH 1100 or placement by the department. Same topics as STAT 1220 with special emphasis on applications to the social and behavioral sciences. May not be taken for credit if credit has been received for STAT 1220 or 1221. *(Fall, Spring, Summer) (Evenings)*

STAT 1223. Elements of Statistics II. (3) Prerequisite: STAT 1220, 1221, or 1222. A continuation of STAT 1220 or 1221 or 1222. Topics include contingency analysis, design of experiments, more on simple linear regression, and multiple regression. Computers will be used to solve some of the problems. *(Fall) (On demand)*

STAT 2122. Introduction to Probability and Statistics. (3) Prerequisite: MATH 1141 or consent of the department. A study of probability models, discrete and continuous random variables, inference about Bernoulli probability, inference about population mean, inference about population variance, the maximum likelihood principle, the minimax

principle, Bayes procedures and linear models. *(Fall, Spring, Summer) (Evenings)*

STAT 3122. Probability and Statistics I. (3) Same as MATH 3122. *(Fall) (Evenings)*

STAT 3123. Probability and Statistics II. (3) Same as MATH 3123. *(Spring) (Evenings)*

Graduate and Advanced Undergraduate
STAT 5123. Applied Statistics I. (3) (3G) Prerequisites: MATH 2164 with a grade of *C* or better and junior standing, or consent of department. Review of stochastic variables and probability distributions, methods of estimating a parameter, hypothesis testing, confidence intervals, contingency tables. Linear and multiple regression, time series analysis. *(Fall) (Evenings) (Alternate years)*

STAT 5124. Applied Statistics II. (3) (3G) Prerequisite: STAT 5123 or consent of the department. One way analysis of variance. Multiway classification. Randomized complete-block designs, nested or hierarchical designs, Latin squares, factorial experiments. Design of experiments. *(Spring) (Evenings) (Alternate years)*

STAT 5126. Theory of Statistics I. (3) (3G) Prerequisite: STAT 3123 or consent of the department. Survey of the mathematical structure supporting applied statistics. Discrete and continuous distributions, moment-generating functions, sampling, point estimation, the multivariate normal distribution, sampling distributions. *(Fall) (Alternate years)*

STAT 5127. Theory of Statistics II. (3) (3G) Prerequisite: STAT 5126 or consent of the department. Point and interval estimations, hypothesis testing, regression and linear hypotheses, experimental designs and analysis, distribution-free methods. *(Spring) (Alternate years)*

Advanced Graduate Only
STAT 7027. Topics in Statistics. (3G) Prerequisite: consent of the department. Topics of current interest in statistics and/or applied statistics. May be repeated for credit with consent of the department. *(On demand)*

STAT 7122. Advanced Statistics I. (3G) Prerequisite: MATH 7143 and STAT 5127 or consent of department. A survey of frequently used statistical techniques selected from: estimation theory and hypothesis testing, parametric goodnes-of-fit criterion and tests for independence, measures of association, regression techniques, multi-sample inferential techniques, Bayes and minimax estimation, admissibility, minimax property. (*On demand)*

STAT 7123. Advanced Statistics II. (3G) Prerequisites: STAT 7122 or consent of the department. Hypothesis testing, Neyman-Pearson Lemma, UMP tests, UMP unbiased tests, monotone likelihood ratio families of distributions, UMP invariant tests. Confidence bounds and regions, uniformly most accurate bounds, regression models, least squares estimates, normal equations, Gaiss-Markov theorem. Large sample behavior of methods of moments estimates, maximum likelihood estimates, likelihood ratio tests, Chi-square tests, approximate confidence regions for large samples. *(On demand)*

STAT 7124. Sampling Theory. (3G) Prerequisite: STAT 5126 or consent of the department. Methods and theory of survey sampling: simple, systematic, stratified, cluster multistage and specialized sampling schemes and the problems of their implementation and analysis. *(On demand)*

STAT 7127. Linear Statistical Models. (3G) Prerequisites: MATH 2164 and 3123 or consent of the department. A selection of topics from the following list: distribution and quadratic forms, regression, dummy variables, models not of full rank, the two-way crossed classification, time series. *(Fall) (Alternate years)*

STAT 7133. Multivariate Analysis. (3G) Prerequisite: STAT 5126 and 5127 or consent of the department. Multivariate distributions. Inference for the multivariate normal model. Further topics from the following: principal components, factor analysis, multidimensional scaling, canonical correlation, discriminant analysis, cluster analysis, multivariate linear models, special topics. *(Fall) (Alternate years)*

TEACHING ENGLISH AS A SECOND LANGUAGE (TESL)

Graduate and Advanced Undergraduate
TESL 5101. Second Language Diagnosis and Evaluation. (3) (3G) For current and future teachers of English as a Second Language (TESL) to develop multiple criteria assessment models as TESL diagnosticians and to master other competencies prescribed by the State of North Carolina. *(Spring)*

TESL 5103. Teaching English as a Second Language. (3) (3G) For current and future teachers of English as a Second Language (TESL) to master a variety of approaches, methods and techniques of teaching ESL and other competencies prescribed by the State of North Carolina. *(Fall)*

Graduate Only
TESL 6000. Topics in Teaching English as a Second Language. (1-6G) May include classroom and/or clinic experiences in the content area. With department approval, may be repeated for credit for different topics. *(Fall, Spring, Summer)*

TESL 6470. Clinical Experience in Teaching English as a Second Language. (3G) Prerequisite: Permission of department. Program of experiential learning activities in the student's level and/or area of academic concentration in an approved school setting. *(Fall, Spring)*

TESL 6476. Seminar and Internship in Teaching English as a Second Language. (3G) Prerequisite: Permission of department. Supervised experiences in school or non-school teaching or training with an emphasis on developing skills as an educational professional. *(Fall, Spring)*

TESL 6800. Individual Study in Teaching English as a Second Language. (1-6G) Prerequisite: Permission of the student's adviser. Independent study under the supervision of an appropriate faculty member. May be repeated for credit. *(Fall, Spring, Summer)*

TESL 7999. Graduate Residence. (0G) Meets Graduate School requirement for continuous enrollment during completion of a capstone project or comprehensive examination. *(Fall, Spring)*

THEATRE (THEA)
(See also Dance and Theatre) (DATH)

Undergraduate
THEA 1101. Introduction to Theatre. (A) (3) Survey and analysis of the elements that make up the theatrical event. Three contact hours. *(Fall, Spring)*

THEA 1102. Creative Drama. (3) Drama and theatre as tools for exploring the processes of synthesis, creativity, divergent thinking, and experiential and authentic learning. *(Fall, Spring)*

THEA 1103. Acting for Non-Theatre Majors. (3) Introduction to the nature of acting for the stage. Study and practice of acting principles, including voice development, movement, and the use of the imagination. (Does not serve as prerequisite for THEA 2209.) *(On demand)*

THEA 1109. Preliminary Experience in Student Teaching. (1) Prerequisite: THEA 1102. Observation of licensed theatre arts teachers on both the primary and secondary school levels. Some participation in class activities required. Graded on a pass/fail basis. *(Fall, Spring)*

THEA 1203. Stagecraft I. (3) Construction and painting skills with some attention to basic elements of theatrical design. Crew hours required in addition to three contact hours. *(Fall, Spring)*

THEA 1204. Stagecraft II. (3) Expansion of THEA 1203. *(On demand)*

THEA 1205. Costuming Techniques and Stage Makeup. (3) Introdction to costume shop equipment, sewing techniques, construction of costume accessories, and theatrical makeup techniques. *(Fall, Spring)*

THEA 1209. Acting I. (3) Prerequisite: DATH 1100. Continuation of the voice/body and improvisational work begun in DATH 1100 with focus on freeing the emotional instrument and beginning character study through monologue work. Six contact hours. *(Spring)*

THEA 2101. Play Analysis. (3) Tools for developing an interpretation of the play script including exploration of the ways scripts are used by directors, actors, designers and dramaturgs in preparing plays for the stage. *(Spring)*

THEA 2103. Costume Design. (3) Costume design theory and history. *(Fall)*

THEA 2205. Scene Design I. (3) Survey of the elements of scene design. *(Fall)*

THEA 2206. Scene Design II. (3) Model building. *(On demand)*

THEA 2207. Puppetry. (3) Types of puppets and the history of puppetry with emphasis on basic puppetry construction and production problems. *(On demand)*

THEA 2208. Audition Techniques. (2) Prerequisite: THEA 2209. The process of auditioning for stage, commercials, and film. Four contact hours. *(Spring) (Alternate years)*

THEA 2209. Acting II. (3) Prerequisite: THEA 1209. Processes of character development based largely on the theories of Stanislavsky. Six contact hours. *(Fall)*

THEA 2212. Stage Lighting. (3) Prerequisite: THEA 1203. Aesthetics of stage lighting including design theory and mechanics of electricity, light, lenses, and control systems. *(Spring)*

THEA 2214. Scene Painting. (3) Scene painting techniques, using primarily water media. *(On demand)*

THEA 2216. Elements of Theatre Staging. (3) Principles and techniques of play directing including analyzing texts, staging, and communication with actors. *(Fall)*

THEA 2217. Directing. (3) Prerequisite: THEA 2216. Continuation of THEA 2216, with emphasis on advanced analysis, coaching, communication with designers, and complex staging problems. *(Spring)*

THEA 2218. Playwriting I. (W) (3) Writing scenes and performing dramatic readings of fellow writers' scenes. A number of plays will be analyzed. *(Fall, Spring on demand)*

THEA 2409. Practicum in Creative Drama: K-8. (3) Prerequisite: THEA 1102 or consent of instructor. Study and application of advanced theories, concepts, competencies and processes unique to primary and middle school settings, with particular attention to the various subject areas. Centered on in-school teaching experience and clinical practice. *(Spring)*

THEA 2410. Practicum in Secondary School Play Production: 9-12. (3) Prerequisite: THEA 1209 and 2216 or consent of instructor. Study and application of advanced theories, concepts, competencies and processes in theatre arts for teaching the specialized areas of production and performance in a secondary school setting (9-12). Includes clinical experience. *(Spring)*

THEA 3001. Topics in Theatre. (1-6) Special topic in theatre. May be repeated for credit with change of topic. *(On demand)*

THEA 3101. Theatre History I. (A) (3) Theatre history from pre-classical periods to the seventeenth century. *(Fall)*

THEA 3102. Theatre History II. (A) (3) Seventeenth century to the present. *(Spring)*

THEA 3209. Acting III. (3) Prerequisite: THEA 2209. Systematic approaches to acting not covered in THEA 2209. May be repeated for credit with change of approach. Six contact hours. *(Spring)*

THEA 3210. Acting IV. (3) Prerequisite: THEA 3209. Exploration of non-realistic characters focusing on various historical periods, theatrical styles, and cultural influences.

May be repeated once for credit. Six contact hours. *(Fall) (Alternate years)*

THEA 3220. Methods of Facilitating Learning in Theatre Arts. (3) Prerequisites: THEA 1109 and EDUC 2100 or consent of the instructor. Exploration of pedagogical methodologies in theatre arts and the application of theory to the classroom setting. Includes instructional planning and review of state mandated goals, objectives, measures and competencies for theatre arts classes. *(Fall)*

THEA 3400. Internship in Theatre. (3-6) Prerequisites: at least a 2.5 GPA, junior status, and permission of department chair. Research and/or in service training for theatre majors and minors in cooperating organizations. Specific content based upon a contract between the student, department, and professional organization. Graded on a pass/fail basis. *(Fall, Spring, Summer)*

THEA 3467. Student Teaching/Seminar: K-12 Fine and Performing Arts: Theatre (15) Prerequisite: approved application for student teaching; senior status; completion of professional education requirements; grades of *C* or better in all courses required for licensure. Corequisite: enrollment only in student teaching. A planned sequence of experiences in the student's area of specialization conducted in an approved school setting under the supervision and coordination of a university supervisor and a cooperating teacher in which the student demonstrates the competencies identified for his/her specific teaching field in an appropriate grade level setting. *(Fall, Spring)*

THEA 3601. Individual Project. (3) Permission of department chair. May be repeated for credit. *(Fall, Spring, Summer)*

THEA 3691. Individual Project. (6) Prerequisite: Permission of department chair. May be repeated for credit. *(Fall, Spring, Summer)*

TRANSLATING (TRAN)

Undergraduate

TRAN 3271. Introduction to Translating. (3) Prerequisite: completion through 2202 level of one language other than English, or equivalent. Difference between translating and interpreting; psychological differences among speakers of different languages; patterns of language development; non-verbal language; levels of language; demonstrations of interpreting; career options, professional associations and their functions; sources of employment information. *(Fall) (Alternate years)*

TRAN 3272. Elementary Translating. (3) Prerequisites: native fluency in English and completion through 2202 level of source language, or equivalent. TRAN 3271 is required for students taking the Certificate sequence, and is strongly recommended for any others who wish to take TRAN 3272. Comparative analysis of translated texts; questions of restructuring texts and adding or subtracting material; style/audience relationship; simple translations from source language to English; sight translation. *(Spring) (Alternate years)*

TRAN 3273. Intermediate Translating. (3) Prerequisite: successful completion of TRAN 3272. Critical analysis of different kinds of English texts and of texts translated into English; translations for specific audiences; problems of terminology; history and theories of translating; development of working dictionaries in field of specialization; investigation of employment opportunities. *(Fall) (Alternate years)*

TRAN 3274. Advanced Translating. (W) (3) Prerequisite: successful completion of TRAN 3273. Study of professional journals in the field of translation; specific problems of source/target language equivalents; translating of substantial text(s) in field of specialization. Texts may be scientific, technical, commercial, scholarly or literary, depending on the student's field of specialization. *(Spring) (Alternate years)*

WOMEN'S STUDIES (WMST)

Undergraduate

WMST 1101. Introduction to Women's Studies. (VC) (3) Introduction to values associated with gender and basic issues confronting women in society, from a variety of cultural and feminist perspectives. *(Fall, Spring)*

WMST 2050. Topics in Women's Studies. (1-3) Credit hours vary with topics. Special topics in Women's Studies. May be repeated for credit as topics vary. *(On demand)*

WMST 3050. Topics in Women's Studies. (3) Special topics in Women's Studies. May be repeated for credit as topics vary. *(On demand)*

WMST 3102. Changing Realities of Women's Lives. (3) Influence of gender, race and class stereotypes on women's identities and choices. Examination of women's individual circumstances through writing. *(Fall, Spring, Summer)*

WMST 3201. Feminist Thought. (W,V,L) (3) Cross-cultural and interdisciplinary survey of the main traditions of feminist theory in the context of their historical and philosophical roots. Required for Women's Studies minor. *(On demand)*

WMST 3227. Feminist Philosophy. (3) Views of contemporary feminist and female philosophers on traditional philosophical issues such as ethics, human nature, the construction of knowledge, modes of social and political organization, the relationship between the mind and the body, and the nature of God. (Same as PHIL 3227.) *(Alternate years)*

WMST 3803. Independent Study. (3) Prerequisite: permission of instructor and Women's Studies Coordinator. Supervised individual study and/or field-based experience in a topic or area of Women's Studies of particular interest to the student. May be repeated for credit. *(Fall, Spring)*

Undergraduate/Available for Graduate Credit

WMST 4050. Topics in Women's Studies. (1-3) (1-3G) Prerequisite and credit hours vary with topics. Special

topics in Women's Studies. May be repeated for credit as topics vary. *(On demand)*

WMST 4101. Applied Research/Field Work. (C) (3) (3G) Prerequisite: permission of the Women's Studies Coordinator. Research and in-service training in cooperative community organizations which provide services to women and their families. Specific content based on contractbetween student, supervising professor and community organization. *(On demand)*

WMST 4191. Women's Health Issues. (3) (3G) Prerequisite: permission of the instructor. Exploration of contemporary issues in women's health from the feminist and women's health movement perspectives. Same as NURS 4191. *(Fall)*

WMST 4260. Women and Aging. (3) (3G) Position of older women in society and the particular problems of and issues for women as they age. (The same as GRNT 4260.) *(Yearly)*

WMST 4601. Senior Colloquium. (3)(3G) Prerequisites: completion of 15 hours in Women's Studies, or permission of instructor. Critical examination of selected issues. Required for Women's Studies minor. *(On demand)*

Graduate and Advanced Undergraduate
WMST 5050. Topics in Women's Studies. (1-3) (1-3G) Prerequisites and credit hours vary with topics. Special topics in Women's Studies. May be repeated for credit as topics vary. *(On demand)*

Graduate Only
WMST 6050. Topics in Women's Studies. (1-3G) Prerequisites and credit hours vary with topics. Special topics in Women's Studies. May be repeated for credit as topics vary. *(On demand)*

WMST 6800. Directed Reading/Research. (3G) Prerequisites: prior written permission of instructor and Women's Studies Coordinator. Independent investigation of a problem or a topic in Women's Studies, culminating in a research paper or a final report. Student must provide a written plan of work before registering for the course. May be repeated for credit. *(On demand)*

FACILITIES AND SERVICES

THE CAMPUS

The campus is located off Harris Boulevard on NC 49 near its intersection with US 29, and only eight miles from the interchange of Interstates 85 and 77. Campus facilities are comprised of air-conditioned contemporary buildings. In addition to classrooms and well-equipped laboratories, the University offers arts and athletic facilities, cafeterias and residence accommodations. The campus is designed for the pedestrian and facilities are generally accessible to students with disabilities.

A map of the campus is included on the inside back cover of this *Catalog*. The Reese Building houses many administrative offices, including Undergraduate Admissions and the Registrar's Office.

UNC Charlotte Uptown. The University offers selected upper division undergraduate and graduate courses and a variety of continuing personal and professional development programs at its UNC Charlotte Uptown center on the second floor of CityFair (North Tryon Street between Fifth and Sixth Streets). Classes are scheduled for the convenience of persons employed in or living near the central business core of the city. The center is located across the street from the public library in the city's cultural district. It is conveniently accessible to pedestrians and is connected to the major buildings in the business core via the overstreet mall.

Parking and Traffic is the responsibility of the Traffic Office, located in the Auxiliary Services Building. Parking on campus requires purchase and display of a University parking permit or payment to park at meters or in visitor's decks. Night Decals for evening-only students are available by the semester. Permits do not guarantee a space will be available nor do they reserve a specific space, except in the case of individuals with disabilities. Abbreviated copies of the *Campus Parking and Traffic Rules and Information* are available from the Traffic Office. For information on fees for motor vehicle registration and parking, see the section on *Financial Information* in this *Catalog*.

The Charlotte Transit System provides bus transportation from the Square in uptown Charlotte and from Southpark (via Eastland Mall and the apartment complexes along Barrington Drive). Service is provided on a regular schedule connecting with established routes throughout the city. Brochures containing detailed information regarding routes, schedules and TRAC passes may be obtained in the Traffic Office, or by calling the Charlotte Transit Authority at (704) 336-3366. Fees are set by Charlotte Transit and are subject to change.

Police and Public Safety services to the University community are provided 24 hours a day, seven days a week. Campus Police Officers are sworn, certified law enforcement officers.

The Department of Police and Public Safety, King Building room 113, is responsible for crime prevention, enforcement of laws and regulations, protection of life and property, preservation of peace, apprehension of criminals, and Lost and Found property.

Emergency telephones are located throughout the campus and are identified by "blue lights."

Recycling services are coordinated by the Recycling Office (547-2137) in the Physical Plant. The University's recycling program, initiated by students in 1990, recycles 24% of the solid waste generated on campus. Residence halls are equipped with outdoor recycling centers and a recycling bin in each room. Aluminum can and paper recycling are available in all academic and administrative buildings on campus. Recycling of bottles and newspapers is quickly expanding to all buildings.

The recycling program and employment in the Recycling Office offers students a chance to actively embrace their environmental responsibilities and demonstrate concerns. The aluminum can, residence hall, and food recycling programs are all programs designed, initiated, and maintained by concerned and active students. These recycling programs and others help UNC Charlotte in its effort to meet North Carolina's 40% waste reduction goal by the year 2001.

Safety Services and Accident Prevention are the concerns of the Environmental/Occupational Safety and Health Office in the Department of Human Resources. It is the responsibility of this office to investigate accidents on campus, conduct safety inspections of all buildings, maintain all reports required by the N.C. Department of Labor and generally work to reduce the risks of illness or injury in the University community. This office is located in room 225, King Building.

EDUCATIONAL SERVICES AND FACILITIES

The J. Murrey Atkins Library, located near the center of the campus, houses an open-shelf collection which includes over 622,559 bound volumes and more than 1.2 million units in microform. The Library of Congress classification system is used for the arrangement of books and periodicals, and an online catalog provides access to a substantial portion of the collection.

Atkins Library meets the informational needs of the University community by offering a variety of services. Reference librarians provide assistance to users in locating information and in use of the library. The library offers general orientation tours during the fall semester. The reference staff offers an active library instruction program, which includes customized presentations and resource guides and instruction sheets on locating and using library resources.

The library also offers electronic search services which provide access to local and worldwide resources. ALADDIN, the Library's online catalog, provides subject, author, title, keyword, and call number access to books from terminals in the library, via the campus network, and via direct access. ALADDIN PLUS terminals provide access to ALADDIN, JACKLINPlus, the online catalog of

the University of North Carolina at Greensboro, and to the Library's Gopher which provides Internet connections to resources around the world. Mosaic WorldWide Web workstations are also available. These provide access, both text and graphical, to Internet resources. The Library's End-User Search Services includes compact disc databases such as ERIC, PsychLit, Nursing & Allied Health, Expanded Academic Index, and Compact Disclosure, and Internet-accessible files such as CARL Uncover, Dow Jones News Retrieval, and First Search. The Library also provides a mediated electronic search service which accesses over 400 files in disciplines ranging from the humanities to the physical sciences.

A number of special collections are available. A selective depository of U.S. publications since 1964, Atkins Library has over 800,000 federal government documents including statistics, bibliographies and full text files on over 200 compact discs. The North Carolina documents collection, begun in 1976, is a rapidly growing collection of publications of state government agencies; the library was designated one of the first depositories for North Carolina documents in 1988. In 1984 the Library was designated a depository for City of Charlotte and Mecklenburg County publications. The Local Public Documents Room Collection for the McGuire Nuclear Plant on Lake Norman is located in the Library. Atkins Library also houses a growing collection of over 47,000 maps, ranging from USGS topographic quadrangles to historic WWII-era Defense Mapping Agency maps.

The Mary and Harry L. Dalton Rare Book and Manuscript Room houses collections of rare books, historical manuscripts, and official University records. The 6200 volume Rare Book Collection specializes in American literature, historical children's books, and English drama. The Manuscript Collections contains an estimated 1.2 million unpublished documents relating to the history of Charlotte-Mecklenburg and surrounding counties. The University Archives and Records Management Program provides information support services for current University operations and includes over 1 million items that document the history of UNC Charlotte.

The Curriculum and Instructional Materials Center provides a laboratory for students and faculty to study and experiment with curriculum and instructional materials and methods. Included in the Center are over 5,000 elementary and secondary textbooks, a file of standardized tests, computer laboratory with software and laser technology, a collection of professional education books, pamphlets and periodicals, curriculum guides from school systems throughout the country, and numerous other resources for the teacher education profession. The Center staff also provides customized library instruction and resource guides for class assignments. The Center also serves as the North Carolina National Aeronautical and Space Administration (NASA) Regional Teacher Resource Center.

Media Services, administered by the Library, is located in the Atkins building. It offers a wide range of traditional audio-visual services, as well as support for emerging technologies to faculty and students for instructional purposes. The production staff is capable of producing color slides (both traditional and computer output), high quality color laser printing, black and white photographs, professional quality audio and video recordings, satellite downlinks and multimedia programs.

Faculty may develop multimedia projects utilizing the hardware and software applications available in the unit's multimedia resource lab. The lab is equipped with networked Macintosh and Gateway computers, scanners, printers, illustration, presentation and authoring software programs. The lab also houses an extensive collection of copyright-free clip art and CD-ROMS.

Media Services loans audio-visual equipment for short-term use to students and faculty. Equipment includes VCR's and monitors, camcorders, projectors (data, video, document, filmstrip, motion picture, opaque, slide and overhead), audio tape recorders, public address systems, record and compact disc players, laser disc players, easels, tripods and screens. The unit also oversees equipment that is permanently installed in teaching classrooms across campus. The Library's collection of motion picture films is located in Media Services. A film preview program is also available whereby films can be made available from the State's film lending service.

The unit manages a television studio and teleconference and teleclassroom facilities as part of two highly sophisticated, fully interactive video networks in conjunction with the NC-REN, and the North Carolina Information Highway. Professional assistance is available upon request.

Additional services provided by the unit include: digital imaging services, video and audio duplication, international video tape conversion, video tape editing (both analog and digital), slide duplication, copystand work, dry mounting, and laminating. The staff offers assistance in equipment operation, and provides consulting and assistance for multimedia, web page and graphic design, and instructional design and development.

Distance Education. UNC Charlotte participates in two state-wide interactive video networks which make it possible to "broadcast" courses originating from the Charlotte campus to participants at other institutions of higher education, community colleges, high schools, hospitals, and selected other sites throughout the state. Both the North Carolina Information Highway (NCIH) and the microwave network maintained by the Microelectronics Center of North Carolina (MCNC) have been used to deliver courses and, under a pilot project beginning in 1997, UNC Charlotte will deliver via technology the major portion of a master's degree in special education and a baccalaureate completion program in engineering technology.

Computing Services supports the University's instructional and research computing activities as well as providing administrative computing in the operation of the University. Academic Computing supports course programs at the undergraduate and graduate levels in the use of various computer techniques and languages as well as research at the graduate level involving the use of an extensive software library. Student computing laboratories located in several campus buildings provide access to a variety of microcomputers and workstations. Access is

provided by the University's mainframes and superminicomputers via a campus network. Access to the J. Murrey Atkins Library Aladdin System and to the Microelectronics Center of North Carolina (MCNC) superminicomputers, the North Carolina Supercomputer Center (NCSC) and the Internet provides additional computing capacity, software and databases.

Learning Center. Designed to improve academic performance and foster meaningful learning experiences, the Learning Center provides services, programs, and materials to help students develop and refine thinking skills, utilize learning and self-management skills, and learn course material more quickly and thoroughly while earning higher grades. Services include: (1) individual consultation and academic counseling regarding learning and self-management skills; (2) assessment of reading/learning skills, learning styles, and study habits/attitudes; (3) computer-assisted instruction for a variety of course subjects; (4) learning and self-management skills workshops; (5) a library of materials with books, audio tapes, video tapes, and printed handouts outlining study/learning strategies; and (6) materials available for the GRE, GMAT, LSAT and other standardized tests.

Tutorial Services. Tutorial Services assists students to improve their learning efficiency and academic performance. Upperclass and graduate student peer tutors selected because of competence in the content area and interpersonal skills provide free tutoring primarily in mathematics, science and foreign languages. Computer-assisted instruction and videos are available to reinforce classroom learning in math and other courses.

Supplemental Instruction. Supplemental Instruction assists students in introductory courses such as BIOL 1110, CHEM 1251 and PSYC 1101 where over a third of the students typically receive a *D* or *F* or withdraw. SI leaders help students refine the unique skills necessary for doing well in each course.

Athletic Academic Advising. Athletic Academic Advising (236 Belk Gymnasium) provides academic and personal counseling to student athletes as a supplement to assistance provided by the Advising Center and the regular departmental adviser. Academic advisers provide prospective student athletes with information on admission procedures and academic requirements, monitor academic progress, arrange supervised study sessions and make referrals to other campus services.

Disability Services. Disability Services assists students with academic and physical accommodations based on documentation of disability. Services include, but are not limited to: (1) priority registration assistance; (2) orientation to available services; (3) development of individualized educational plans; (4) special testing accommodations; (5) taped textbooks, braille and/or large print service for visually impaired students; (6) assistive technology loans; (7) referrals to tutoring and other campus support services; and (8) interpreting services for students who are deaf; (9) individual counseling and advocacy; and (10) referrals to human services agencies.

In all possible cases, UNC Charlotte will obtain educational auxiliary aids from existing resources such as Vocational Rehabilitation agencies and private charitable organizations. The University assumes no responsibility for the provision of attendants, individually prescribed devices, readers for personal use, or any devices or services of a personal nature. The arrangements for these services are entirely the responsibility of the student.

The Disability Services Office also serves as a resource to faculty, staff, and the University community by providing consultation and advocacy services on issues related to compliance with the Americans with Disabilities Act of 1990.

Student Support Services. Student Support Services is a federally funded program which provides academic, personal, and career counseling, intensive tutorial assistance, and mentoring to low income and first generation college students or students with a disability.

McNair Post-Baccalaureate Achievement Program. This federally supported grant program is designed to increase the likelihood that low-income and first generation college students and students from other groups under-represented in graduate school will further their education at the doctoral level. It pairs eligible junior and senior level students with faculty members from academic disciplines across the curriculum to work on research projects. Sophomores are eligible for some aspects of the program.

Minority Academic Services (MAS) in the division of Academic Affairs, is committed to providing quality academic support services to increase the retention and graduation of minority students at UNC Charlotte. MAS provides academic advising to minority freshmen and sophomores primarily through three programs: SAFE, UTOP and PRODUCE.

Producing Readiness of Diverse University Cohorts in Education (PRODUCE). UNC Charlotte is one of the eight schools in the University of North Carolina system that has received a National Science Foundation Grant to: (1) improve the quality of the learning environment for minorities in Science, Mathematics, Engineering and Engineering Technology; (2) increase the number of minority students graduating with degrees in Science, Mathematics, Engineering and Engineering Technology; and (3) develop and implement effective techniques of attracting talented minority students who would otherwise not choose science or engineering as a career.

Student Advising for Freshman Excellence. The goal of SAFE is to facilitate the transition from high school to college of all incoming African-American freshmen. Through orientation sessions, student advising, individual and group tutoring, co-curricular and social activities, and weekly meetings with student counselors, SAFE empowers students to acquire the skills necessary for academic success and the establishment of rewarding careers. Some students are eligible to participate during the sophomore year.

University Transition Opportunities Program. UTOP is a summer academic program designed to facilitate the

minority student's transition from high school to the University by involving a limited number of incoming freshmen in a rigorous collegiate experience prior to fall semester enrollment. Seven hours of credit are awarded for successful completion of UTOP coursework, which consists of English Composition, Supplemental English, and Freshman Seminar.

Office of Adult Students and Evening Services (OASES) provides access, academic advice, and information to prospective and enrolled adult and evening students. OASES serves as a liaison with academic departments, advising centers, and administrative offices for students who are 25 years old and older and for all students who need to conduct business after 5 p.m. or from off-campus. Activities and programs include Re-entry open houses, orientation, the Non-Traditional Student Organization, scholarships, child care information, and a student newsletter, "For Adults Only." For adults returning to school after an extended absence, OASES provides information about the admissions process and opportunities available through the Adult Students Admission Program (ASAP).

Academic Assessment Services. Academic Assessment Services administers the university's foreign language proficiency exam, the math placement exam, and several standardized tests including the Graduate Record Exam (GRE), Graduate Management Admission Test (GMAT), College Level Examination Program (CLEP), and the Law School Admission Test (LSAT). Proctoring services are available for special testing for other universities or the campus community.

University Writing Programs brings together interests, needs, and resources related to writing across the university. It is responsible for development activities for faculty members such as workshops, networking and the annual Wildacres retreats held each May. Through the **Writing Resources Center** assistance is provided for members of the university community who want to become more effective writers. The center is staffed by graduate and undergraduate tutors who work with writers at all stages of the writing process: prewriting, focusing, organizing, revising, and editing. Programs include one-on-one tutoring; group tutoring; classroom workshops; library assistance; and computer assisted instruction of Macintosh and IBM computers.

Office of International Programs (OIP) The Office of International Programs offers academic and cultural programs to enhance the learning environment of the University community. A minor in International Studies enables students to pursue an interdisciplinary and comparative study of foreign cultures and societies while they fulfill the requirements for a major in a bachelor's degree program. (See *Courses of Study and Special Programs*.)

Education Abroad. UNC Charlotte encourages its students to study and live in a foreign country as a part of their undergraduate career. Education Abroad Programs offers students the opportunity to study or work abroad for a year, a semester or a summer. Programs are available in countries virtually all over the world. Deadlines for application for fall semester or year-long programs are usually in January or February, deadlines for spring semester programs are in September or October, and deadlines for summer programs are generally in Mareh or April.

Faculty Development. The Office of International Programs serves as a facilitator for faculty exchange opportunities. Faculty are encouraged to work with the OIP staff in exploring and applying for a wide range of international exchanges. Among those are the Fulbright Exchange Program, reciprocal department exchanges, and exchanges based on agreements between UNC Charlotte and overseas institutions of higher learning. Faculty and administrators also are able to take advantage of OIP's professional development program. This program provides opportunities for the further enhancement of international interests through travel for international study and research and faculty colloquia on international topics.

International Student/Scholar Services are designed to address the needs of foreign students and scholars in the areas of immigration, language, campus orientation and cultural understanding. In addition, the staff serves as a liaison to other campus offices on related matters and provides programs that enhance the student and scholar's learning experience including Conversation Partners, The Host Family Program, advising of international student clubs, and Cross-Cultural Training Workshops.

Campus Programming. Various events are sponsored independently and in cooperation with other departments and agencies. They include the annual International Festival, dinners featuring specific cultures, the Education Abroad Fair, Summer Institutes, and the Chapter office of Phi Beta Delta Honor Society for International Scholars.

The English Language Training Institute (ELTI) provides intensive English as a Second Language instruction for international students planning to attend American universities or colleges and for individuals pursuing professional training in the United States. ELTI holds three sessions per year--fall, spring, and summer--and offers eight language proficiency levels, including a level for applicants for graduate study. Average class size is 12 students and students attend classes 20-24 hours per week. Exceptional students in Levels 6 and 7 are eligible to take University courses in addition to their English classes. ELTI also offers a communications course for international teaching assistants, consulting for international faculty at UNC Charlotte, short-term programs with English language and American culture themes, and curricula custom-designed for professional groups.

Public Service. The OIP seeks to initiate and respond to the international needs and interests of the community. Current programs include: (1) *Community Forums*--symposia on topics of current international interest; (2) *Great Decisions*--an annual series of lecture/discussions during the months of February and March on eight key policy issues; (3) *International Business Workshops*--programs focusing on specific aspects of international trade; (4) *Charlotte World Affairs Council*, a regional center for education and discussion of world affairs; (5) *Cross-Cultural training*, individually designed workshops that focus on appreciation for other cultures and development of

skills in effective communications across cultures; and (6) *Japan-America Society*, a university-community joint venture to enhance understanding of Japan and U.S.-Japan relations.

The University Career Center is a comprehensive career service designed to assist undergraduate and graduate students in all stages of career development: career decision making, career planning, and career placement. Experiential learning is a key component and all students are encouraged to take advantage of internship, cooperative education, and other career exploration programs. With the University Career Center acting as a coordinating and academic support unit for experiential learning, the majority of students are expected to graduate with career related experience.

The goals of the Center are: to help all students make and act on career decisions which maximize their potential and long term development; to enable the timely involvement of students in experiential learning programs; to engage students, faculty, and employers in quality experiential learning programs; and to promote receptivity to and involvement with UNC Charlotte, the colleges, and the students among individuals and organizations outside the University. The Center maintains relations with over 600 area and national employers, and also has placed interns in Israel, Germany, and France. Over 10,000 jobs and internships are handled through the office each year.

Services provided by the Center range from individual advising and videotaped mock interviews to small group workshops on such topics as resume writing, effective interviewing, uncovering the hidden job market, and preparing for the transition into the work world. Other services include resumé referrals to employers, on campus interviewing, a career resource collection, a University Career Consultants Network Internship, job and career choice fairs and special career programs are available. The staff also present programs in the classrooms, residence halls and student organization settings. Three newsletters are published to inform students about workshops, programs, and employers recruiting on campus. Students are encouraged to visit the center and to start their experiential learning program and career planning in their freshman year or first semester at the University. The University Career Center has received national recognition for its "state-of-the-art" program initiatives, including Career Expo, Nursing and Education Fairs, Experiential Learning Job Fair, Mock Interview Day, Part-time Job Fair, and Career Exploration Day.

Part-time Employment Off-campus. The University Career Center assists students in obtaining part-time employment off-campus. Job listings and assistance are available in the King Building. Students are encouraged also to participate in career related experiences such as co-op, internships, and 49erships which can be arranged through the University Career Center. Students are encouraged to limit employment to allow for success in a full 15-18 hour course load each semester.

The Office of Research has been established to inform and assist the University community in seeking grants, contracts and service agreements for funding research, training and other scholarly activities. The staff is available to consult with faculty and to assist in pre-award activities such as identification of sources, interpretation of guidelines, preparation of budgets and compliance with regulations. The Office also maintains a resource area consisting of grant guidelines, reference books and proposal preparation aids, and a home page that links to funding agencies and the community of science. The office also is responsible for oversight and management of the University Vivarium. The director provides liaison to Oak Ridge Associated Universities (ORAU), a not-for-profit consortium of 82 colleges and universities, of which UNC Charlotte is a sponsoring institution. ORAU identifies and helps solve problems in science, engineering, technology, medicine, and human resources, and assists its member institutions to focus their collective strengths in science and technology on issues of national significance.

The Chimney Rock Park Field Station is located in the Blue Ridge Mountains, 30 miles southeast of Asheville. The University has an agreement with Chimney Rock Park to investigate the biological, geological and cultural features of the 800-acre park. Area available for study extends from the Broad River at the bottom of Hickory Nut Gorge to the top, a vertical climb of over 1,500 feet.

The UNC Charlotte Experimental Ecological Reserve is a 100-acre tract of land set aside on campus by the UNC Charlotte Board of Trustees as a permanent ecological reserve for use as an outdoor classroom and laboratory. The reserve includes an eight-acre old field, pine stands, mixed pine-hardwood forest, and a relatively undisturbed 10-acre watershed of oak-hickory forest.

The UNC Charlotte Rocky River Wildlife Refuge is a 46-acre natural area located east of Charlotte in Stanly County. Its purpose is to preserve the natural features of the area and allow research and field trips to study the plants and animals within the North Carolina slate belt formation.

The UNC Charlotte Botanical Gardens, located on campus, consist of the McMillan Academic Greenhouse, the Van Landingham Rhododendron Glen, and the Susie Harwood Ornamentals Garden. Begun in 1966, these gardens combine indoor and outdoor facilities for teaching, research and public display of a wide variety of native and exotic plants.

STUDENT AFFAIRS AND SERVICES

The University of North Carolina at Charlotte provides a comfortable and enjoyable environment for students that is conducive to study. The services, facilities, and programs of the University promote individual student development and foster a community which promotes the involvement of students in their intellectual, cultural, spiritual, emotional, and physical development.

The Bonnie E. Cone University Center serves as the hub of activity for informal gatherings and social and educational activities on campus and provides an attractive, comfortable place for relaxation and study. Services and facilities include the Student Activity Center, art galleries,

information desk and music listening lounge, TV/Video Lounge, the Candy Shoppe and concert and discount movies tickets center, 24-Hour Program Hotline, UNC Charlotte Educational Access Channel 22 and channel 60 on campus and meeting rooms and facilities for dances, lectures, concerts, films and banquets.

Also located within Cone University Center are the offices of the Student Body Government, *University Times, Sanskrit,* Video Yearbook, Student Media Marketing, Black Student Union, University Program Board, Venture Program, Office of Student Activities, Student Activity Fees Clerk, Campus Event Information Office, I.D. Office, Food Service and Reservations, Conferences, and Event Planning, located in the administrative offices of the University Center.

The I.D. Office is co-located with the Food Service Office in the cafeteria in Cone University Center. It is open 8 a.m. to 6 p.m. Monday through Thursday and 8 a.m. to 5 p.m. Friday.

After Hours (Cone Center) and **The Rathskeller** (Residence Hall Cafeteria) can be reserved for dances and other events. The University Program Board (UPB) and Campus Programs offer a wide variety of entertainment including name musical and novelty acts, lectures, movies, minority programs, women's programs and children's programs.

The Bookstore offers new and used textbooks, non-required special interest and gift books, school supplies, computers and related equipment, greeting cards, gifts and clothing items. Services include sale and development of film and special ordering of books not carried in stock.

University residence halls, suites and apartments offer students a variety of living arrangements. Four residence halls house approximately 500 students each. Each room includes study and sleeping areas for two students and is equipped with built-in dressers, study desks, chairs and closets. Each floor has a central lounge plus study, and seminar rooms. Two elevators service each air-conditioned building. Each building also contains an office for the full-time professional staff (residence coordinator), student mail boxes, a concessions area, a lounge and a laundry room. A meal service contract is required in the residence halls.

In suite housing, two students share a double room and four students share a bath and a den area. This lifestyle also requires a meal service contract.

On-campus apartments offer students a more private living environment and require a more self-reliant lifestyle. Each apartment is a four-bedroom unit, with one student assigned to each bedroom. The four students share a bathroom area and kitchen complete with cooking facilities and living/dining space. A meal plan is optional, allowing students the experience of buying and preparing their own food, if they so desire. (*Note: freshmen are not eligible for the apartment lifestyle.*)

Several options are available for summer housing. For information, contact the Housing and Residence Life Office.

Students who plan to live on campus should apply as soon as possible as assignments are made according to date of receipt of contract. An application for housing will be sent to the entering student following his or her final admission to the University. A $100 deposit is required when the application is returned to the Director of Housing and Residence Life.

Housing facilities designed specifically for students in wheelchairs are available. Wheelchair students who receive confirmation of residential space have priority in assignment to these facilities *as long as the University is able to offer space*. It is extremely important that the housing application is received before all space is committed so that this priority for assignment to appropriate facilities can be exercised. Wheelchair students may be considered for priority status on the waiting list on the basis of (1) the date of application and (2) the degree of utilization of wheelchair-equipped facilities as compared to the proportion of wheelchair students who apply.

Assignment to a disability accessible housing space, requires documentation of the disability and special needs in accommodations by the Disability Services Office. Documentation must be provided to Disability Services when the housing application is submitted and no later than June 1.

The University does not assume any responsibility for the provision of attendants for students with disabilities. Such arrangements are entirely the responsibility of the individual student and should be established well in advance of the time the services are to begin.

Food Service. Resident students living in Sanford, Moore, Holshouser, Scott, Hawthorn, Hickory, Cedar, Sycamore, Oak and Poplar Suites **must** have a food service contract. Current options require freshmen in these areas to have either a 15 or 19 Meal Plan. All others living in these areas must purchase a specified amount of declining balance or choose one of the above plans. All Meal Plan meals must be taken in the Resident Dining Hall (RDH) or the Crossroads Cafe. Declining balance plans can be used as cash at any food service facility on the campus.

During the period of occupancy, UNC Charlotte will provide meals according to the plan selected except that no meals are provided during fall break, Thanksgiving break, winter break and spring break.

Dining service contracts are binding for one semester. Cancellations can only be made under special circumstances (i.e., withdrawal from the University or moving to an on-campus apartment) and only upon the approval of the Office of Meal Plans, 49er Card and Insurance. Students may make meal plan changes during the registration period, which lasts through the first day of classes. The first change will be at no charge, an administrative charge of $25 will be accessed for each subsequent change. Students living in highrises and suites may make changes again during the two days of housing room change on a pro-rata basis. **No other changes may be made after this time, unless the student moves from required housing.** Students living in apartments and off-campus may make

changes and cancellations on a pro-rata basis until fall/spring breaks. **NO CHANGES OR CANCELLATIONS MAY BE MADE AFTER FALL/SPRING BREAKS.** (Exceptions must be approved by the Food Service Administrator.) All changes and cancellations must be made in the Meal Plans, 49er Card and Insurance Office, 162 Auxiliary Services Building, or by calling (704) 547-2138 or 2139.

Resident students in apartments and commuter students may purchase any of the Meal Plans, including a 5 Meal Plan or may purchase, at any time, declining balance with a minimum amount of $25.

Anyone may purchase individual meals at either of the boarding cafeterias (RDH and Crossroads Cafe). Vending machines are located throughout the campus, and several locations have microwave ovens for heating items.

The Counseling Center provides services and programs to assist in individual and group growth, career development and personal adjustment problems. Staffed by psychologists and counselors, the Counseling Center offers services to students, faculty and staff. Initial counseling appointments may be arranged in Room 158 of the Atkins Building. Information between an individual and his/her counselor is confidential in accordance with guidelines established by the American Psychological Association.

Individual counseling is provided to help a person develop better coping strategies, resolve conflict and handle crisis situations. Career counseling assists the person in exploring interests, work values and abilities through individual counseling sessions, career exploration groups and utilization of the Career Resource Library, and use of the SIGI Plus computer-assisted career guidance system. Each semester, groups are offered that teach a skill or focus on a particular theme. The administration of career interest inventories, personality surveys and achievement tests provide an additional method of self-exploration for students.

Outreach and consultations are vital functions of the Counseling Center. Staff members are available to consult with faculty, staff and student organizations on topics such as enhancing communication, improving the learning environment and helping the problem student. Outreach activities include programs conducted outside the Counseling Center to meet the needs of a group or organization. These programs usually focus on personal development, or career development.

The Brocker Health Center provides a range of out-patient medical care to all students. In addition to basic services, the Center houses a pharmacy, medical facilities for laboratory, X-rays and allergy injections, and a physical therapy department. Other services include specialized clinics for orthopedics, gynecology, podiatry, HIV screening, and vision screening.

Brocker Health Center is fully operational between from 8:00 am to 5:00 pm, with physicians and support staff on duty Monday through Friday. Appointments are recommended, but a walk-in clinic is available from 8:00 am to 4:00 pm.

Seriously ill students and emergencies are referred to local hospitals or other appropriate medical facilities. Students and parents are urged to review their insurance plans to be sure that they have adequate coverage for emergency treatment or hospitalization. The University does not provide health insurance for students. Information about private insurance coverage is mailed to all students during the summer and is available at the Health Center or Auxiliary Services.

Students coming to the Health Center must present their current University identification card. The student health fee covers most of the cost for services at the Health Center; however, additional fees are charged for X-ray, pharmacy, laboratory and orthopedic services. Fees are subject to change. For more information, visit the Health Center or telephone 547-4617.

The Student Employment Office (101 King Building) assists students in locating work on campus. The University participates in the federal Work-Study Program and attempts to match students with jobs related to their academic interests. Students are encouraged to limit employment hours to allow for success in a full 15-18 hour course load each semester.

OUTREACH: THE UNIVERSITY AND THE COMMUNITY

The University recognizes that its mission reaches beyond the borders of the campus to the surrounding region and the state. The University touches many facets of community life and serves as a catalyst for development of a regional approach to solving problems in education, economic development, transportation, the environment, cultural amenities, and the quality of life. Faculty, staff and students have made significant impact on the region through research, historic preservation, planning, the arts and literature, and the delivery of government and social services.

The Office of Alumni Affairs, located in the Alumni House on Highway 49, serves as the liaison between the University and all graduates. The Director of Alumni Affairs is the chief administrative officer, coordinating activities of the office of Alumni Affairs and carrying out the objectives, goals and policies of the Alumni Association.

The General Alumni Association's primary purpose is to involve alumni in the promotion, advancement, and support of the mission of UNC Charlotte and to develop and to stimulate a continuing interest in *Alma Mater* by providing opportunities for service, fellowship, and loyalty. A 28-member Board of Governors, elected by the active membership, establishes policy of the Alumni Association and assists in the planning and implementation of projects, events, and programs. Active members are those who contribute to the University or the UNC Charlotte Foundation.

The Alumni Association co-sponsors with UNC Charlotte the Commencement Reception for new graduates, parents, faculty and friends. Other programs include the Alumni Hall of Fame, chapters and constituent organizations, homecoming activities, networking socials, public affairs events, reunions, merchandising opportunities, group travel and athletic rousers, recognition programs for outstanding seniors, and sponsorship of the Student Alumni Ambassadors. Alumni have the opportunity to support academic excellence through the Chancellor's Club which annually provides Alumni Scholarships for Merit to three students at the University.

The Alumni Office seeks to maintain lifelong contact with all graduates. Graduates are encouraged to become active in the Alumni Association and to notify the Alumni Affairs Office of address changes, employment information and other significant events, such as marriages, births and honors. In this way, adequate records can be maintained, and the Alumni Office can publish news about graduates in the **University Magazine.** The address is Alumni Affairs Office, Alumni House, UNC Charlotte, Charlotte, NC 28223; telephone (704) 547-2273 or 1-800-PIK-UNCC for those outside Mecklenburg.

The Ben Craig Center, located in the University Research Park, is a non-profit corporation established by UNC Charlotte in conjunction with some of the major private/sector interests in the community. The mission of the Center is to support the growth and development of entrepreneurial companies. It accomplishes this through its business incubator and international programs.

The Office of Continuing Education, Extension, and Summer Programs. Recognizing that learning must be a lifelong activity, the University provides opportunities for adults to pursue their continuing education through degree-related studies and special non-credit programs.

Short courses, seminars, workshops and conferences designed to keep adults current and productive are offered through *Continuing Education*. Specific programs are provided each year for the continuing professional education of accountants, architects, managers in the public and private sectors, engineers, nurses, psychotherapists and counselors, teachers and other school personnel, information specialists, and elected public officials. Special lectures and forums also are offered in the arts, sciences, humanities, and public policy for the personal enrichment of all interested citizens.

Through *Extension*, courses for academic credit are offered at off-campus sites to serve citizens who live beyond easy commuting distance from the campus. Options for delivery include sending a UNC Charlotte faculty member to a remote location to teach a course in person, or using one of two state-wide interactive video networks to link a UNC Charlotte faculty member on the campus in Charlotte with students attending class at remote locations throughout the state. The two video networks currently utilized by UNC Charlotte are the North Carolina Information Highway (NCIH) and the microwave network maintained by the Microelectronics Center of North Carolina (MCNC). In addition, the university has the ability to deliver educational programming over Cable Channel 22, which is the channel reserved for the university by the local cable service.

During the summer, the office schedules a variety of credit and non-credit programs on the campus and at approved off-campus sites.

Contact the Office of Continuing Education, Extension, and Summer Programs at 547-2424 for specific information about its programs.

The Office of Development, located in 1021 Colvard, is responsible for coordination of University efforts to secure financial support from the private sector and to serve as the receiving point for gifts of dollars, securities, works of art, land and equipment.

Through the Foundation of The University of North Carolina at Charlotte, the General Alumni Association, Friends of UNCC, the Athletic Foundation and advisory boards, the various avenues of supporting the University are made known to individuals, corporations and foundations.

The Parents Association of UNC Charlotte exists to involve all parents of UNC Charlotte students in University activities. Through regular communication and campus activities, parents achieve a close rapport with the University. The Association supports UNC Charlotte through financial means, good will and recruitment of students. For information call (704) 547-2271.

The Foundation of The University of North Carolina at Charlotte was founded in 1960 and has had from its inception the goal of undergirding the University and assisting it in the quest for excellence. To accomplish its goals, the Foundation invites private contributions.

The Office of Public Relations, located in the Reese Building, is the official communications channel through which the University disseminates information to its various publics. The Office has three major functions: (1) external media relations; (2) internal communications; and (3) official University publications that are distributed to off-campus audiences. The Office distributes news and features stories about University programs and its people as well as hometown releases about achievements of students. A weekly newsletter, *Campus News,* informs faculty and staff about campus activities. The Office maintains the University's Home Page on the World Wide Web. In addition, the Office provides assistance in printing official publications for University departments.

The Urban Institute develops and supports programs which give impetus to the University's urban mission. Its programs are designed to meet the applied research needs of urban and developing areas. The Institute is a catalyst for programs which focus on the Charlotte Metropolitan region. It also provides administrative and technical support to organizations involved with issues of an urbanizing society. Projects are initiated by members of the faculty, community clients or the Institute staff and focus on a broad spectrum of urban topics, e.g., local government, the environment, land use, business assistance and economic development.

Students may become involved in Institute projects as part-time research assistants or interviewers, or they may become involved with the Institute in conjunction with coursework or degree requirements by writing term papers, graduate theses, or completing internships. The Institute's program areas are:

Community Research and Service conducts needs assessments and public opinion surveys of both target and general populations focusing on issues of concern to local, regional and national clients. The program also provides support to government and community agencies in the planning and implementation of special projects and strategic planning activities.

Economic Development and Planning engages in research and planning for community, industrial and commercial development. Types of projects include land use plans, data collection and analysis for economic development, population estimates and projections, analysis of growth patterns, industrial targeting studies, housing research and the publication of regional business and political directories.

Southwest Waste Exchange promotes safe and cost-effective waste management and environmental protection. The program publishes a bi-monthly catalog containing listings for industrial by-products and surplus materials and conducts workshops on the topics of recycling and the safe management of hazardous waste materials.

Technical Services specializes in the application of microcomputer technology for public sector clients. A major, on-going project involves providing software support and training for a state-wide computerized school bus routing project. Other services include database design and desktop mapping projects for research and outreach projects.

Carolinas Land Conservation Network is a membership organization open to agencies and individuals who have an interest in the conservation of land in the central piedmont region of the Carolinas. The program maintains an information base of conservation initiatives in the region and implements research and educational activities relating to broadening the community's understanding of the importance of conservation efforts.

Evaluation Research provides research and evaluation services focusing on human service programs. Impartial, third-party program evaluation is provided to decision makers in government and private organizations for use in responsible financial management and long-term decision making regarding program policy and funding issues.

The Center for Professional and Applied Ethics assists professionals and other clients locally, regionally and nationally in identifying, analyzing, and resolving ethical dilemmas. As a public service center, its focus is the practical and applied--not the theoretical and abstract. Its services include ethics audits, seminars, in-service education, ethics literature, and individual or institutional consultation.

The Mathematics and Science Education Center works closely with southwest regional teachers and school administrators to provide professional development activities for K-12 science and mathematics teachers in the form of cognate area and methodology updating and enhancement. The Center offers academic year and summer programs of varied topics and duration, and professional contacts through science and mathematics organizations. In addition, the Center operates both a Pre-College Program, to enhance the mathematics and science academic background of underrepresented, minority and female, middle through high school students; and a Summer Ventures Program for academically talented high school students. Contact the Mathematics and Science Education Center at (704) 547-4838 for specific information about its programs.

UNIVERSITY REGULATION OF STUDENT CONDUCT

As students willingly accept the benefits of membership in the UNC Charlotte academic community, they acquire obligations to observe and uphold the principles and standards that define the terms of the UNC Charlotte community.

The University of North Carolina at Charlotte has enacted two codes governing student conduct. The University has also enacted a program for the prevention of the use of illegal drugs and alcohol abuse. All UNC Charlotte students are obligated to be familiar with these codes and to conduct themselves in accordance with the standards set forth.

THE UNC CHARLOTTE CODE OF STUDENT ACADEMIC INTEGRITY governs the responsibility of students to maintain integrity in academic work, defines violations of the standards, describes procedures for handling alleged violations of the standards, and lists applicable penalties. The following conduct is prohibited in that *Code* as violating those standards:

A. **Cheating.** Intentionally using or attempting to use unauthorized materials, information, notes, study aids or other devices in any academic exercise. This definition includes unauthorized communication of information during an academic exercise.

B. **Fabrication and Falsification.** Intentional and unauthorized alteration or invention of any information or citation in an academic exercise. Falsification is a matter of altering information, while fabrication is a matter of inventing or counterfeiting information for use in any academic exercise.

C. **Multiple Submission.** The submission of substantial portions of the same academic work (including oral reports) for credit more than once without authorization.

D. **Plagiarism.** Intentionally or knowingly presenting the work of another as one's own (i.e., without proper acknowledgment of the source). The sole exception to the requirement of acknowledging sources is when the ideas, information, etc. are common knowledge.

E. **Abuse of Academic Materials.** Intentionally or knowingly destroying, stealing or making inaccessible library or other academic resource material.

F. **Complicity in Academic Dishonesty.** Intentionally or knowingly helping or attempting to help another to commit an act of academic dishonesty.

A full explanation of these definitions, and a description of procedures used in cases where student violations are alleged, is found in the complete text of The UNC Charlotte Code of Student Academic Integrity. This Code may be modified from time to time. Users are advised to contact the Office of the Dean of Students to assure they consult the most recent edition.

THE UNC CHARLOTTE CODE OF STUDENT RESPONSIBILITY sets forth standards relating to student conduct other than academic conduct, describes the procedures for handling cases, and sets forth applicable sanctions. The following conduct or attempt to engage in the following conduct is prohibited and subjects a student to disciplinary action: **[Note: Letters *j* and *p* have been intentionally omitted for continuity in record keeping.]**

A. Causing physical harm to any person, or causing reasonable apprehension of such harm, or subjecting another person to a substantial risk of physical injury or emotional harm. Verbal or physical abuse, intimidating conduct, or other conduct which violates University policy on sexual harassment or "fighting words" harassment as set forth in Policy Statements #61 and #95, constitute a violation of this disciplinary standard. The full text of both policies is available in the Office of the Dean of Students.

B. Using, possessing or storing any weapon, dangerous chemical, or explosive without authorization.

C. Initiating or causing to be initiated any false report, warning or threat of fire, explosion, or other emergency.

D. Interfering with normal University activities, including, but not limited to, studying, teaching, research, the expression of ideas, University administration, speeches and other public or private events, and fire, police or other emergency services. Acts prohibited in University Policy Statement #58, "interference with University Operations," which prohibits student action taken "with intent to obstruct or disrupt any normal operation or function of the University," and Policy Statement #96, "Policy on Conduct at Speech Events," which prohibits certain disruptive activities at speech events on campus. Full texts of both policies are available in the Office of the Dean of Students.

E. Knowingly violating the terms of any disciplinary sanction imposed in accordance with this Code.

F. Possessing any controlled substance, or manufacturing, selling or delivering any controlled substance or possessing with intent to manufacture, sell or deliver, any controlled substance. Minimum penalties and certain other requirements apply where controlled substance offenses are at issue, pursuant to University Policy Statement #87, "Program to Prevent Use of Illegal Drugs and Alcohol Abuse." That policy is available in the Office of the Dean of Students.

G. Misusing or damaging fire safety equipment or elevators.

H. Furnishing false information to the University; misrepresenting or concealing one's organizational

affiliation(s) or sponsorship(s) for the purpose of enticing another person into joining or participating in a group or organization.

I. Forgery, unauthorized alteration, or unauthorized use or misuse of any document or instrument of identification.

K. Theft or attempted theft of property or services, possessing stolen property; or possessing property that is not your own without owner authorization.

L. Destroying or damaging the property of others or University property.

M. Failing to comply with the reasonable directions of University officials, including but not limited to campus police officers, or Residence Life Staff, acting in performance of their duties.

N. Violating published University regulations or policies, as approved by the Vice Chancellor for Student Affairs. Such regulations or policies include but are not limited to the residence hall contract, as well as regulations relating to entry and use of University facilities, use of vehicles and amplifying equipment, campus demonstrations, and misuse of identification cards.

O. Possessing, consuming, or distributing alcoholic beverages without University authorization including but not limited to possessing or consuming of alcoholic beverages by students below the legal minimum age; displaying or consumption of alcoholic beverages in campus residences by students less than twenty-one years of age; furnishing, or selling any alcoholic beverages to any person not of sufficient legal age to possess or consume such alcoholic beverage; failing to abide by the provisions of an alcoholic beverage approval form; or making any sale of any alcoholic beverage on the University campus. (The full text of University Policy Statement #57, "Use and Consumption of Alcoholic Beverages," is available for inspection in the Office of the Dean of Students.)

Q. Being present in or using University premises, facilities, or property without University authorization.

R. Using or possessing fireworks on University premises or at University activities without University authorization.

S. Engaging in disorderly conduct such as fighting, threatening behavior, public disturbance, or drunk and disorderly conduct.

T. Causing or permitting a person, in relation to membership in a society, club or similar organized group (whether or not recognized by the University), to participate in any activity that subjects that person or others to unnecessary risks of physical injury or extreme mental distress, whether or not such person has consented to participation in the activity. The full text of University Statement #83, "Hazing Policy," is available in the Office of the Dean of Students.

U. Failing to apply funds received from a student in trust for payment of utility charges in University housing; failing to provide funds under an express or implied agreement to share utility costs in University housing.

V. Engaging in computer abuse, including but not limited to: unauthorized use of or tampering with the operation of any University computer system including hardware and software; inspecting, modifying, or copying programs or data in University owned or controlled computing facilities without authorization or for purposes other than that for which authorization was given; disrupting or interfering with legitimate use of University computing systems by authorized users; using or copying any University software except as permitted under license; using University computing facilities to use or copy any software except as permitted under license. (The full text of University Policy Statements #66, "Computer Use Policy." and #67, "Proprietary Software Policy," are available in the Office of the Dean of Students.)

PROGRAM TO PREVENT USE OF ILLEGAL DRUGS AND ALCOHOL ABUSE (POLICY #87)

General. In keeping with efforts to maintain an environment that supports and encourages the pursuit and dissemination of knowledge, it is the policy of The University of North Carolina at Charlotte to consider the use of illegal drugs or alcohol abuse by students, faculty and staff or by others on premises under University control to be unacceptable conduct that adversely affects the educational environment.

Further, the University considers a sound awareness, education, and training program indispensable in combating illegal use of drugs and alcohol abuse, both as a preventive measure and as a remedy. The scope of the University program addresses the awareness needs of students, faculty, administrators, and other staff members and includes the following minimum components.

- The health hazards associated with the use of illegal drugs and with alcohol alone.
- The incompatibility of the use of illegal drugs or abuse of alcohol with maximum achievement of personal, social, and educational goals.
- The potential legal consequences (including both criminal law and University discipline) of illegal drug abuse.
- The effective use of available campus and community resources in dealing with illegal drug abuse and alcohol abuse problems.

Responsibilities: It is the responsibility of all students, faculty, and staff to conduct themselves in such a way as

to contribute to an environment free of illegal drug use and abuse of alcohol. Also, students, faculty and staff are responsible, as citizens, for knowing about and complying with the provisions of North Carolina law that make it a crime to possess, sell, deliver, or manufacture those drugs designated collectively as "controlled substances" in Article 5 of Chapter 90 of the North Carolina General Statutes.

The Health Educator and the Assistant Director of Personnel for Training and Employee Relations are responsible for designing and carrying out a comprehensive program of awareness education and training for students, faculty and staff on the subject of preventing the illegal use of drugs and abuse of alcohol. The Substance Abuse Prevention Committee will provide guidance and support to their efforts, which will be coordinated through the Vice Chancellor for Student Affairs as Coordinator of Drug Education.

The Director of the Counseling Center shall, within the limits of available resources, provide services and programs to students, faculty and staff seeking assistance with problems of illegal drug use or alcohol abuse. Counseling Center services to faculty and staff are available under the University's Employee Assistance Program (EAP). In cases where the treatment needs of such students, faculty and staff exceed the resources of the Center, the Center shall provide referral to appropriate facilities in the community.

Collaboration with Community Resources. The University's program emphasizes collaboration with local resources such as the Charlotte Drug Education Center, Council on Alcoholism and Chemical Dependency, Mecklenburg County Substance Abuse Services, Charlotte Treatment Center, Open House, Inc., Alcoholics Anonymous, Al-Anon, etc. To this end, the University shall participate in the Mecklenburg Coalition on Substance Abuse and will establish a local advisory board to further collaborate between the University and the Charlotte Community.

Education and Prevention Activities. The University's institution-wide awareness, education, and training efforts stress prevention. The goal of these efforts is (1) to encourage non-users of illegal drugs and alcohol to continue to be non-users, (2) to encourage users of alcohol to do so responsibly, and (3) to encourage users of illegal drugs to stop.

Illegal Use of Drugs and Abuse of Alcohol. The use of illegal drugs and the abuse of alcohol are considered by the University to be problems which can be overcome. Therefore, the educational and rehabilitative services mentioned above are available on a confidential basis. However, the possession, sale, delivery, or manufacture of illegal drugs will not be tolerated on campus or off campus in the event that the interests of the University may be affected. The University will cooperate fully with law enforcement agencies and will apply appropriate disciplinary processes should a student, faculty member, or staff member violate criminal statutes with regard to illegal drugs. Violations may subject a student, faculty member or staff member to prosecution and punishment by civil authorities and to disciplinary action by the University. It does not constitute "double jeopardy" for the University to initiate its own disciplinary proceedings for the same offense when the alleged conduct is deemed to affect the interests of the University.

Disciplinary procedural safeguards applicable to one's status as a member of the University community will be followed. These are described in the following documents:

Status	Document
Students	*UNC Charlotte Code of Student Responsibility*
SPA Staff	*State Personnel Manual*
EPAStaff	*EPA Non-Faculty Personnel Policy*
Faculty	Section 603 of the *UNC* Code and *Section 6* of *UNC Charlotte Tenure Document*

(Minimum sanctions described below in the Policy would also apply to employees who do not fall in any of the categories above.) In the event a student is also an employee of the University, the minimum sanctions for employment as well as student status would apply.

The use of illegal drugs may lead to a variety of sanctions, from written warnings with probationary status to expulsion from enrollment or discharge from employment. However, in accordance with the Policy on Illegal Drugs adopted by the Board of Governors from the University of North Carolina, the following minimum penalties shall be imposed for the particular offenses described.

Trafficking in Illegal Drugs

1. For the illegal manufacture, sale or delivery, or possession with intent to manufacture, sell or deliver, of any controlled substance identified in Schedule I, N.C. General Statutes 90-89, or Schedule II, N.C. General Statutes 90-90 (including, but not limited to, heroin, mescaline, lysergic aeid diethylamide, opium, cocaine, amphetamine, methaqualine), any student shall be expelled and any faculty member or staff member shall be discharged.

2. For a first offense involving the illegal manufacture, sale or delivery, or possession with intent to manufacture, sell or deliver, of any controlled substance identified in Schedules III through VI;, N.C. General Statutes 90-91 through 90-94, (including, but not limited to, marijuana, pentobarbital, codeine) the minimum penalty shall be suspension from enrollment or from employment for a period of at least one semester or its equivalent. For a second offense, any student shall be expelled and any faculty member or staff member shall be discharged.

Illegal Possession of Drugs

1. For a first offense involving the illegal possession of any controlled substance identified in Schedule I, N.C. General Statutes 90-89, or Schedule II, N.C. General Statutes 90-90, the minimum penalty shall be suspension from enrollment or from employment for a period of at least one semester or its equivalent.

2. For a first offense involving the illegal possession of controlled substance identified in Schedules III through VI, N.C. General Statutes 90-91 through 90-94, the minimum penalty shall be probation, for a period to be determined on a case-by-case basis. A person on probation must agree to participate in a drug education and counseling program, consent to regular drug testing, and accept such other conditions and restrictions, including a program of community service, as the Chancellor or the Chancellor's designee deems appropriate. Refusal or failure to abide by the terms of probation shall result in suspension from enrollment or from employment for any unexpired balance of the prescribed period of probation.

3. For second or other subsequent offenses involving the illegal possession of controlled substances, progressively more severe penalties shall be imposed, including expulsion of students and discharge of faculty members or staff members.

Suspension for a Minimum Period of "One Semester or its Equivalent." This logically may be interpreted to mean, in the case of a student, forfeiture of at least one full semester of academic credit or attendance; this may be accomplished either (1) by suspending the student for the unexpired balance or the semester during which guilt is determined, with attendant loss of all academic credit for that semester, or (2) by placing the student on probation for the unexpired balance of the semester during which guilt is determined and suspending the student for the duration of the next succeeding semester; in the case of a faculty member or staff member, it may be interpreted to mean forfeiture of pay for a period of 18 weeks. Since the current State Personnel Act specifies that disciplinary suspensions cannot exceed three days, offenses for which an 18-week minimum suspension is required by the Board of Governors' policy will result in discharge of an employee subject to the State Personnel Act.

Suspension Pending Final Disposition. When a student, faculty member, or staff member has been charged by the University with a violation of policies concerning illegal drugs, he or she may be suspended from enrollment or employment before initiation or completion of regular disciplinary proceedings if, assuming the truth of the charges, the Chancellor or, in the Chancellor's absence, the Chancellor's designee concludes that the person's continued presence within the University community would constitute a clear and immediate danger to the health or welfare of other members of the University community; provided, that if such a suspension is imposed, an appropriate hearing of the charges against the suspended person shall be held as promptly as possible thereafter.

References. The use of alcoholic beverages on the University campus is regulated by Policy Statement #57, "Policy on Alcoholic Beverages." Policy Statement #62, "Employee Assistance Program," establishes a free employee assistance service as part of the University Counseling Center.

IMMUNIZATION REQUIREMENTS

North Carolina state law requires all students entering a college in the state to meet the immunization requirements specified in the table on the following page. A family physician or the Health Department must verify that the student has the necessary immunizations. UNC Charlotte's *Report of Medical History* form, provided by the Office of Undergraduate Admissions, may be used for this purpose.

Students who do not have a complete immunization record on file when beginning classes will have 30 days to obtain the required immunizations. A campus clinic will be available. **Students who are not in compliance with these requirements within 30 days of the first day of class will be required to withdraw from classes.** The following students are exempt from these requirements: (1) Students who attend classes only in the evening (i.e., after 3:30 pm; (2) Students who attend classes off campus only; and (3) Students who enroll in no more than four hours per semester.

Medical and religious exemptions can be requested through the Health Center. Questions and forms should be directed to: UNC Charlotte Student Health Service, Charlotte, NC 28223.

IMMUNIZATION REQUIREMENTS

A. For students 17 years of age and younger

3 DTP (Diptheria, Tetanus, Pertussis) or 3 Td (Tetanus-diptheria) doses; one dose must be within the last ten years.

3 POLIO *(oral)* doses.

*2 MEASLES *(Rubeola)* doses on or after the first birthday.

**1 RUBELLA dose on or after first birthday.

1 MUMPS dose on or after first birthday.

B. For students born after December 31, 1956, to 18 years of age

3 DTP or 3 Td doses, one dose must be within the last ten years.

*2 MEASLES *(Rubeola)* doses on or after the first birthday.

**1 RUBELLA dose on or after first birthday.

1 MUMPS dose on or after first birthday.

C. For students born prior to January 1, 1957, through age 49.

Primary series of 3 DTP or 3 Td doses - one dose must be within the last ten years.

A documented Td BOOSTER within the past ten years will be accepted as evidence of the initial series.

**1 RUBELLA dose.

D. For students 50 years of age and older.

Primary series of 3 DTP or 3 Td doses - one dose must be within the last ten years.

A documented Td BOOSTER within the past ten years will be accepted as evidence of the initial series.

E. For all Students

Tuberculin Skin Test (PPD) within the 12 months preceding classes.

Chest x-ray if test is positive.

* History of physician diagnosed measles disease OR laboratory proof of immunity is acceptable. Must repeat measles vaccine if received even day prior to first birthday.

** ONLY laboratory proof of immunity to rubella is acceptable, physician diagnosed rubella disease is not acceptable.

DIRECTORY

History of the University of North Carolina

In North Carolina, all public educational institutions that grant baccalaureate degrees are part of the University of North Carolina. The University of North Carolina at Charlotte is one of the 16 constituent institutions of the multi-campus state university.

The University of North Carolina, chartered by the N.C. General Assembly in 1789, was the first public university in the United States to open its doors and the only one to graduate students in the eighteenth century. The first class was admitted in Chapel Hill in 1795. For the next 136 years, the only campus of the University of North Carolina was at Chapel Hill.

In 1877, the N.C. General Assembly began sponsoring additional institutions of higher education, diverse in origin and purpose. Five were historically black institutions, and another was founded to educate American Indians. Several were created to prepare teachers for the public schools. Others had a technological emphasis. One is a training school for performing artists.

In 1931, the N.C. General Assembly redefined the University of North Carolina to include three state-supported institutions: the campus at Chapel Hill (now the University of North Carolina at Chapel Hill), North Carolina State College (now North Carolina State University at Raleigh), and Woman's College (now the University of North Carolina at Greensboro). The new multi-campus University operated with one board of trustees and one president. By 1969, three additional campuses had joined the University through legislative action: the University of North Carolina at Charlotte, the University of North Carolina at Asheville, and the University of North Carolina at Wilmington.

In 1971, the General Assembly passed legislation bringing into the University of North Carolina the state's ten remaining public senior institutions, each of which had until then been legally separate: Appalachian State University, East Carolina University, Elizabeth City State University, Fayetteville State University, North Carolina Agricultural and Technical State University, North Carolina Central University, the North Carolina School of the Arts, Pembroke State University (now the University of North Carolina at Pembroke), Western Carolina University, and Winston-Salem State University. This action created the current 16-campus University. (In 1985, the North Carolina School of Science and Mathematics, a residential high school for gifted students, was declared an affiliated school of the University.)

The UNC Board of Governors is the policy-making body legally charged with "the general determination, control, supervision, management, and governance of all affairs of the constituent institutions." It elects the president, who administers the University. The 32 voting members of the Board of Governors are elected by the General Assembly for four-year terms. Former board chairmen and board

members who are former governors of North Carolina may continue to serve for limited periods as non-voting members emeriti. The president of the UNC Association of Student Governments, or that student's designee, is also a non-voting member.

Each of the 16 constituent institutions is headed by a chancellor, who is chosen by the Board of Governors on the president's nomination and is responsible to the president. Each institution has a board of trustees, consisting of eight members elected by the Board of Governors, four appointed by the governor, and the president of the student body, who serves ex-officio. (The NC School of the Arts has two additional ex-officio members.) Each board of trustees holds extensive powers over academic and other operations of its institution on delegation from the Board of Governors.

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Jacklyn A. Simpson, B.S., M.Ed.
Associate Vice Chancellor for Housing and Residence Life

Phillip Riordan, B.A., M.A.
Associate Director, Programs

Frank Fleming, B.S., M.Ed.
Associate Director, Operations

The following persons are employed by various denominations and churches and are present on campus to serve the spiritual needs of the University community:

Donald S. Rogers, B.A., B.D, M.A.
Baptist

Daniel McClintock, B.A., M. Div.
Baptist

Barbara Neff Hutchison, B.A., M.A.
Catholic

Lou Ann Sellers, B.S., M. Div.
Methodist/Presbyterian/Lutheran

Ida Johnson, B.A., M. Div.
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Faculty

* **Indicates appointment to the Graduate Faculty.**

***Clemmie Dixon Spangler (1986),** *President, The University of North Carolina*, B.S., University of North Carolina at Chapel Hill; M.B.A., Harvard University

***James H. Woodward (1989),** *Chancellor, The University of North Carolina at Charlotte, and Professor of Civil Engineering*, B.S.A.E., M.S.A.E., Ph.D., Georgia Institute of Technology; M.B.A., The University of Alabama at Birmingham

Jeffrey Kenneth Adams-Davis (1984), *Director, English Language Training Institute, and Lecturer in ELTI*, B.A., University of North Carolina at Charlotte; M.A., University of North Carolina at Chapel Hill

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INDEX

-A-

A.A. Degree Rule 14
Academic Advising 25
Academic Assessment Services 330
Academic Calendar 2
Academic Honors 30
Academic Integrity, Code of 336
Academic Probation 30
Academic Regulations 24-37, 126
Academic Structure 5-6
Academic Suspension 30-31
Accounting, Department of 78
  Admission to 13
  B.S. in 78
  Cooperative Education 78
  Course Descriptions 177-179
  M.Acc. in 131
Accreditation 6
Activities, Student 7
Administration, Educational 147-148
  Course Descriptions 179-181
Administrative Officers
  and Staff 343
Administration of UNC 342
Admission
  Early 12
  Graduate 123-125
  Immunization Requirement and 339-340
  Of Escrow Program Participants 15
  Of Foreign Applicants 12, 123
  Of Former Students 14
  Of Freshmen 12
  Of Non-degree Students 15
  To Second Degree or Major 15
  Of Senior Citizens 15
  Of Transfer Students 12
  Of Visitors 15
  To Candidacy (Graduate) 129
  To The University 11-15, 123-125
  Undergraduate 11-15
Adult Health Nursing,
  Department of 110-112
  M.S.N. 164
Adults Students & Evening Services 330
Adult Students Admission Program (ASAP) 15
Advanced Placement Course Credit 31
Advanced Standing 31-32
Advisers, Academic 25
Aerospace Studies,
  Department of 116-117
  Academic Program 116
  Scholarship Program 117
  Course Descriptions 181
Affirmative Action 5
African-American and African Studies,
  Department of 45
  B.A. in 45
  Minor 45
  Course Descriptions 176-177
After Hours 332
Air Force ROTC 116-117
Alcoholic Beverages 337-339
Alumni Association, General 333
Alumni Affairs, Office of 333
Alumni Scholarships for Merit 22
American Studies 45
  Minor in 46
  Course Descriptions 182
Anthropology 73-74
  B.A. in 73
  Minor in 73
  Course Descriptions 182-184
Apartments. *See Residence Halls*
Appeal Procedures
  Academic Status 31, 128
  Admission or Readmission 12-15, 123-124
  Refunds 20
  Residence Status 18
  Suspension 30-31
  Traffic and Parking 19
Application Dates 11
Application Fee
  Graduate 18
  Undergraduate 18
Application Process, Admissions 12
Application Process, Financial Aid 21, 122
Application for Degree 32-33, 128
Architecture, College of 42-43
  Admission to 13
  Bachelor of 42
  B.A. in 42
  Curriculum Outlines 43
  M.ARCH 131-132
  Course Descriptions 184-187
Army ROTC 117-118
Art, Department of 46-48
  Admission to 13
  B.A. in 47
  B.F.A. in 47
  Course Descriptions 187-193
Arts and Sciences, College of 44-75
  Advising Center 44
  Course Descriptions 187
Assessments, Special 19
Assistantships, Graduate 122-123
Astronomy, Course Descriptions 300
Athletic Academic Advising 329
Athletic Training Curriculum 112
Athletics 7
Attendance Policy 27
Auditors, Registration of 26, 124
Automobile, Registration of 19

-B-

Baccalaureate Degrees 38-41
  Requirements for 24-37
Baseball 7
Basketball 7
Ben Craig Center 334
Biology, Department of 48-50

B.A. in 49
B.S. in 49
Honors Program 50
M.A. in 133
M.S. in 132-133
Ecology/Environmental Option 49
Medical Technology Option 49
Microbiology Option 49
Minor in 50
Minor in Biotechnology 50
Course Descriptions 194-198
Black Student Union 9
Board of Governors 342
Board of Trustees 343
Bonnie E. Cone Scholarships for Merit 22
Bookstore 332
Botanical Gardens 331
Brocker Health Center 333
Bus Service 327
Business Administration,
Belk College of, The 76-87
Admission to 13
Prebusiness 77
Business Honors Program 77
Department of Accounting 78
Department of Economics 78-80
Department of Finance and
Business Law 80-81
Individualized Major 81-82
International Business 82-83
Department of Management 83-84
Department of Information&Operations
Management 84-86
Department of Marketing 86-87
Master of Business
Administration Degree 133-135
M.B.A. Plus Certificate 135
Course Descriptions, M.B.A. 274-277
Business Affairs 345-346
Business Honors, Course Descriptions 198
Business Law, Course Descriptions 198

-C-

Cafeterias. *See Food Service*
Calendar, Academic 2
Cameron Scholars Program 22
Campus Map . . . . . Inside back cover
Career Center 331
Cars, Registration of 19
Cartography Lab 60
Catalog Policies 25
Certificates, Graduate 130-131
Certificates of Advanced Study . . . 38-41, 124-125
Licensure, Teacher 33
Chancellor's Club 334
Chancellor's List 30
Change of Degree or Major 27, 126
Charlotte Graduate Center 122
Charlotte Transit System 327
Chemical Engineering 119
Chemistry, Department of 50-52
B.A. in 51
B.S. in 51
Biochemistry Option 51
Five-Year B.S./M.S. Program 52
Honors Program 52
Medical Technology Option 51-52
Minor in 51
Preprofessional Options 51
Teacher Licensure 51
M.S. in 135-136
Course Descriptions 204-207
Child and Family Development 88-89
B.A. in 88
Birth-Kindergarten Teacher Licensure 89
Minor in 89
Student Teaching 89
Course Descriptions 207-208
Children of Veterans 22
Chimney Rock Park Field Station 331
Civil Engineering, Department of 98-100
B.S.C.E. 99-100
Curriculum Outline 99-100
M.S.C.E. 149
Course Descriptions 198-204
Classification of Undergraduates 26
Clubs 9
COGE Goals 5, 33-37
College Level Examination
Program (CLEP) 31-32
Colvard Scholarships for Merit 22
Commencement Marshals 30
Communication Studies 52-55
B.A. in 53
Minor in 54
Journalism Minor 55
Course Descriptions 210-211
Commuting 302
Comprehensive Examination, Graduate 129
Computing Services 328-329
Computer Engineering,
Course Descriptions 211-212
Computer Science, Department of 100-102
Admission to 13
B.A. in Computer Science 100
B.A. in Information Science 100
B.S. in Computer Science 100
B.S. in Computer Engineering 100-101
Curriculum Outlines 101-102
Minor 101
M.S. in 136-137
Course Descriptions 212-217
Cone University Center 331
Consortium, Charlotte Area Educational 26-27
Consortium Registration 26-27
Continued Enrollment,
Requirements for 30-31, 127
Continuing Education 334
Cooperative Education 118
Correspondence Courses 32
Correspondence Directory . . . . . inside front cover
Counseling, Special Education, and
Child Development 88-89, 92-93
B.A. in Child & Family Development 88-89
B.A. in Special Education 92-93

M.A. in Counseling 145-147
M.Ed. in Special Education 141-143
Course Descriptions . . 207-208, 218-219, 320-322
Counseling Center 333
Course Descriptions 174-326
Course Exclusion Policy 29
Course Level Requirement 33
Course Load, Graduate 126
Course Load, Undergraduate 25
Course Numbering System 174
Course Requirements for
Baccalaureate Degrees 33-37
Credit by Examination 32
Credit by Examination Fee 19
Credit for Military Training 32
Credit from Two-Year Institutions 32
Credit Hours, Requirement 33
Credit, Transfer 32, 127-128
Credits 25
Criminal Justice, Department of 55
B.A. in 55
Minor in 55
M.S. in 137
Course Descriptions 208-211
Cross Country 7

-D-

Dance and Theatre, Department of 56
B.A., Dance 56
B.A., Theatre 56
Minors 56
Honors Programs 56
Teacher Licensure 56
Course Descriptions (Dance) 219-221
Course Descriptions (Theatre) 324-325
Dean's List 30
Declaration of Major 27
Degree, Graduate
Application for 123
Change of 126
Requirements 126-131
Second 128
Degree, Undergraduate
Application for 32
Change of 27
Requirements 24-37
Second 27
Degrees Offered 38-41
Dentistry 119
Departmental Honors Programs 114
Development 333
Directory 341
Administrative Officers and Staff 343
Board of Trustees 343
Emeritus Faculty 372
Faculty 347
UNC Administration 342
UNC Board of Governors 342
Directory of Programs
and Degrees 38-41
Disability Services, Office of 329
Doctoral Programs 125
Dormitories. *See Residence Halls*
Dropping a Course 26-27
Drugs, Illegal 337-339
Dual Undergraduate/Graduate
Registration 26, 126

-E-

Early Admission 12
Earth Sciences 59-61
B.A. in 61
B.S. in 61
Minor in 61
Course Descriptions 245-246
Ecological Reserve 331
Economics, Department of 78-80
Admission to 13
B.A. in 79
Minor in 80
Cooperative Education 79-80
Curriculum Outlines 80
M.S. in 137-138
Course Descriptions 221-224
Education, Course Descriptions 224-225
Educational Abroad Program 330
Education, College of 88-95, 137-147
Counseling, Special Education, and
Child Development 88-89, 92-93
B.A. in Child & Family
Development with B-K Licensure . . 88-89
B.A. in Special Education 92-93
M.A. in Counseling 147
M.Ed. in Special Education 141-143
Supported Employment & Transition
Graduate Certificate 143
Educational Administration, Research,
and Technology 88
Ed.D. in Educational Leadership 147-148
M.Ed. in Instructional Systems
Technology. 145
M.S.A. 146-147
Middle, Secondary, and
K-12 Education 88, 90-92
B.A. in Middle Grades Education 90-91
Licensure in Secondary Education . . . 91-92
M.Ed. in Middle Grades Education 140
M.Ed. in Secondary Education . . . 140-141
M.Ed. in Teaching English as
a Second Language 143-144
Reading and Elementary Education 88-90
B.A. in Elementary Education 89-90
M.Ed. in Reading, Language,
And Literacy 143
Teacher Education Policies & Procedures . . 93-95
Teaching Fellows Program 94
Educational Administration, Research
and Technology 88
Ed.D. in Educational Leadership 148
M.Ed. In Instructional Systems Technology . 145
M.S.A. 147
North Carolina Teacher
Licensure 88
Certificate of Advanced Study 38-41, 124

Course Descriptions 179-181, 232-233, 313
Educational Instructional Systems Technology, Course Descriptions 232-233
Educational Services and Facilities 327-335
Electrical Engineering, Department of 102-103
B.S.E.E. 102-103
Curriculum Outline 103
M.S.E.E. 149-150
Ph.D. 151-152
Course Descriptions 225-232
Electrical Engineering Technology, Course Descriptions 235-236
Elementary Education 88-90
B.A. 89-90
M.Ed. 139-140
Course Descriptions 234-235
Emergency Numbers . . . . . inside front cover
Emeritus Faculty 372
Employment, Student 21, 122, 331
Engineering, William States Lee College of . 96-109
Admission to 13
Baccalaureate Programs 97
Continuing Engineering Studies 98
Department of Civil Engineering 98-100
Department of Computer Science 100-102
Department of Electrical Engineering 102-103
Department of Engineering Technology 103-107
Department of Mechanical Engineering and Engineering Science 108-109
Graduate Degree Programs 149-152
Admissions 123
Liberal Engineering Studies 98
Special College Programs 97-98
Course Descriptions 267
Engineering Science, Course Descriptions . 246-248
Engineering Technology, Department of 103-107
Admission to 13
B.S.E.T. Degree 104
Curriculum Outlines 105-107
Course Descriptions 233-234
English, Department of 56
B.A. in 57
M.A. in 152-153
Minor 57
Teacher Licensure 57-58
Course Descriptions 238-244
English Language Training Institute 116, 330
English Placement Procedures 14
English, Teaching as a Second Language 144-145
Course Descriptions 323-324
Equal Opportunity 5
Escrow Program Participants, Admission of 15
Examination, Comprehensive (Graduate) 129
Examination, Credit by 32
Exchange Programs 116
Exclusions, Course 29
Expenses, Student 16
Experiential Learning Programs 118
Experimental Ecological Reserve 331
Extension Courses 334

-F-

Facilities and Services 327-335
Faculty 347-372
Family and Community Nursing, Department of 110-112
M.S.N. 165
M.S.N./M.H.A. 165
Fee Payment 16
Finance and Business Law, Department of 80
B.S.B.A. 82
Cooperative Education 81
Individualized Major in Business 81-82
Major 81
Course Descriptions 198, 248-249
Financial Aid 21-23
Financial Information 16-23
Food Service 332
Foreign Applicants, Admission of
Graduate 125
Undergraduate 12
Foreign Language Placement Proficiency 14
Foreign Languages, Department of 58-59
B.A. in 58
Minors 59
Placement 58
Summer Scholarships 58
Teacher Licensure 58
Translating 59
Course Descriptions 249-250
Former Students, Readmission of 14
Foundation of UNC Charlotte 334
Fraternities 9
French
Course Descriptions 250-251
Major in 58
Minor in 58
Freshman English Placement Procedures 14
Fretwell Scholarships 22

-G-

GED 12
General Education
Courses Approved for Two Goals 33
Goals of UNC Charlotte Education 5, 33-37
Grading Policy 28-29, 33
Requirements for all Baccalaureate Degrees 24-37
Geography 59-61
Geography and Earth Sciences, Department of 59-62
B.A. in Earth Sciences 61
B.A. in Geography 60
B.S. in Earth Sciences 61
B.S. in Geography 60
B.S. in Geology 62
Curriculum Outlines 61-62
Minor in Earth Sciences 61

Minor in Geography 61
M.A. in Geography 154-156
Teacher Education 61
Course Descriptions:
Earth Science 245-246
Geography 251-254
Geology 254-255
Geology 60-62
German
Major in 58-59
Minor in 59
Course Descriptions 255-256
Gerontology 62-63
Minor in 62-63
M.A. in 156
Course Descriptions 257-258
Goals of UNC Charlotte Education 5, 33-37
Good Academic Standing 30
Government, Student Body 8
Governors, Board of (UNC System) 342
Grade Changes 28
Grade Point Average 29, 33, 127
Grade Point Deficit 30, 127
Grade Point Requirements 33, 127
Grade Reports 28
Grades 28-29
Grades, General Education 29
Grading Policies 28-30
Graduate Assistantships 122
Graduate Council 121-122
Graduate Faculty 122, 343-375
Graduate School 121-173
Academic Regulations 126
Administration 121
Admission to 123
Catalog Policies 25
Degree Requirements 126-131
Financial Information 122-123
Grading Policies 127
History of 121-122
Programs Offered 131-173
Readmission 123-124, 127
Graduation, Application for Degree . . . 32-33, 128
Graduation Fee 19
Graduation with Distinction 30
Grants, Student 21
Greek, Course Descriptions 256-257
Greek Organizations 9
Gymnasium 7

-H-

Handicapped Services. *See Disability Services*
Handicapped, Vocationally 22
Health Administration 157
M.H.A. 157
Course Descriptions 258-259
Health Center 333
Health Education, Course Descriptions . . . 263-264
Health Promotion and Kinesiology,
Department of 110, 112
Athletic Training Curriculum 112
B.S. in Health Fitness 112
M.Ed. in Health Promotion 167
Course Descriptions 296-298
History, Department of 63-64
B.A. in 63
Honors Program 63-64
Minor in 63
M.A. in 158
Teacher Licensure in 63
Course Descriptions 259-263
History of the University 341
History of the University System 341
Honoraries 9
Honors, University
Course Descriptions 264-265
Honors Programs, Departmental 114
Honors Programs, University 114
Hours, Attempted 25-26
Hours, Earned 25-26
Hours, Progression 26
Housing. *See Residence Halls*
Housing, Cost of 18
Housing Deposit 18-19
Housing Refunds 20

-I-

I.D. Office 332
Illegal Drugs, Use Prevention 337-339
Immunization Requirements 339-340
Incomplete, Grade of 29
Individualized Major in Business 81-82
B.S.B.A. 82
Industrial Engineering Technology,
Course Descriptions 265
Infirmary. *See Health Center*
Information, General 4-6
Information&Operations
Management 84-86
B.S.B.A. 84-85
Cooperative Education 85
Majors 84
M.I.S. 85
Operations Management 85
Curriculum Outlines 86
Course Descriptions 265-266, 295
Inter-Institutional Registration 27
Inter-Institutional Doctoral Degree
Programs 172
Inter-Institutional Master's Degree
Programs 172
International Baccalaureate Program (IB) 31
International Business Major 82
B.S.B.A. 82
International Programs, Office of 330
International Student Exchange 116
International Student/Scholar
Services 330
International Studies 114-116
Education Abroad Programs 115-116
English Language Training Institute 116
International Student Exchange Program 116
Minor in 115
Internships 118

Intramural Sports 8

-J-

Japanese
Minor 59
Course Descriptions 266
Journalism *(see also, Communication Studies)* . . . 55
Course Descriptions 266
Judiciary, Student 8

-L-

Latin, Course Descriptions 266
Law 119
Law Enforcement. *See Criminal Justice*
Leadership Development, Student 8
Learning Center 329
Legislature, Student 8
Library 327-328
Liberal Engineering Studies,
Course Descriptions 267
Liberal Studies
Admission 159
M.A. 159
Course Descriptions 266-267
Loans 21

-M-

Magazine, Literary 9
Major,
Change of 27
Declaration of 27
Second 27
Undecided 27
Management,
Department of 83-84
B.S.B.A. 83
Major 83
Cooperative Education 84
Curriculum Outline 84
Course Descriptions 282-284
Management Information Systems,
Course Descriptions 265-266
Manufacturing Engineering Technology,
Course Descriptions 282
Map, campus . . . . . inside back cover
Marketing,
Department of 86-87
B.S.B.A. 87
Cooperative Education 87
Major 87
Minor 87
Course Descriptions 284-285
Marshals, Commencement 30
Master of Arts, Admission to 123-124
Counselor Education 145
English 152
Geography 154
History 158
Liberal Studies 159
Mathematics 160
Mathematics Education 160
Psychology 169
Sociology 172
Master of Business Administration 133
Admission to 133
Course Descriptions 274-277
Master of Education, Admission to 138
Master of Science, Admission to 124-125
Applied Statistics 162
Biology 132
Chemistry 135
Computer Science 136
Criminal Justice 137
Economics 137
Engineering 149
Physics 168
Master of Architecture
Admission to 131
Master of Science in Nursing (M.S.N.)
Admission to 164
Master of Public Administration
Admission to 170
Master's Degree, Second 128
Mathematics, Department of 64-66
B.A. in 65
B.S. in 65
Minors 65
Teacher Licensure in 64-65
Cooperative Education 66
Honors Program 65
Master's Degrees 160-162
Ph.D. Degree 162
Mathematics Education, Course
Descriptions 267-268
Operations Research,
Course Descriptions 295-296
Statistics, Course Descriptions 322-323
Course Descriptions 268-274
Mathematics Placement Procedures 14
Mathematics/Science Education Center 335
MBA Plus Certificate 135
McNair Post-Baccalaureate
Achievement Program 329
Meal Plans 18, 332
Mechanical Engineering,
Course Descriptions 278-282
Mechanical Engineering and Engineering
Science, Department of 108-109
B.S.M.E. 108-109
Curriculum Outline 109
M.S.M.E. 149-150
Ph.D. 151
Course Descriptions 233-234
Media Board, Student 8
Media Services 328
Medical Care 333
Medical Technology 119
Medicine 119
Middle Grades Education 90-91
Couse Descriptions 277
Middle, Secondary, and K-12 Education . 88, 90-92
B.A. in Middle Grades Education 90-91
Licensure in Secondary Education 91-92

Course Descriptions 278
Military Science Area
(Army ROTC) 116
Scholarship Program 117
Course Descriptions 286-287
Minor 28
Minor in
African-American and African Studies 45
American Studies 46
Anthropology 73
Biology 50
Biotechnology 50
Chemistry 52
Child and Family Development 89
Communication Studies 54
Computer Science 101
Criminal Justice 55
Dance 56
Earth Sciences 61
Economics 80
English 57
Foreign Languages 59
French 59
German 59
Japanese 59
Spanish 59
Geography 61
Gerontology 62
History 63
International Studies 114
Journalism 55
Marketing 87
Mathematics 65
Museum Studies 66
Music 67
Operations Research (Graduate) 168
Philosophy 67
Physics 69
Political Science 70
Psychology 72
Religious Studies 73
Social Work 74
Sociology 74
Theater 56
Urban Studies 74
Women's Studies 74
Minority Academic Services 329
Minority Presence Grant Program 21, 122
Mission Statement 4-5
Morrison Scholarships 23
Motor Vehicle Registration Fees 19
Museum Studies 66
Minor 66
Course Descriptions 287
Music, Department of 66
Admission to 13
B.M. 66-67
Minor 67
Course Descriptions 287-290

-N-

New Student Fee 19
New Student Orientation/Registration 14
Newspaper, Student 8
Niner-Video 9
Non-Degree Students, Admission of 15
Non-Matriculation, Graduate 124
North Carolina Minority Presence
Grant Program 21, 122
Nursing 164
M.S.N. 164
M.S.N./M.H.A. 163
Nursing and Health Professions,
College of 110-113
Admission to 13, 110
Pre-Nursing 110
B.S.N. 110
RN/B.S.N. 110
Curriculum Outlines 111-112
Departments of:
Adult Health Nursing 110-112
M.S.N. 164
Family & Community Nursing 110-112
M.S.N. 165
M.S.N./M.H.A. 165
Health Promotion &
Kinesiology 110, 112
M.Ed. 167
M.S.N. 164-167
MSN/MHA 166
Course Descriptions 290-295

-O-

Optometry 119-120
Operations Management 84
Major 85
Course Descriptions 295
Operations Research, Graduate Minor 168
Course Descriptions 295-296
Organizations, Student 9
Out-of-State Students,
Tuition and Fees for 18
Outreach, University and Community 333

-P-

Parents Association 334
Parking 19
Pass/No Credit Option 29
Pell Grants 21
Penalties for Parking Violations 19
Personal Conduct, Discriminatory 5
Pharmacy 120
Philosophy, Department of 67-68
B.A. in 67
Honors Program 67-68
Minor in 67
Course Descriptions 298-300
Physical Education 112
Physician 333
Physics, Department of 68-69
B.A. in 68
B.S. in 68-69
B.S., Applied Physics Option 69
Minor in 69

Cooperative Education 69
Honors Program 69
M.S. in Applied Physics 168
Course Descriptions 300-303
Placement Examinations 14
Plagiarism 336-339
Police Services 327
Political Science, Department of 69-70
B.A. in 69-70
Minor in 70
Honors Program 70
Master of Public Administration 170
Course Descriptions 303-305
Post-Baccalaureate Students 124
Pre-Dental Preparation 119
Pre-Law Society 119
Pre-Medical Preparation 119
Prerequisites 26
Privacy of Student Educational Records 30
Probation, Academic 30
Professional Schools, Preparation for 118-120
Program Approval, Graduate 129
Program Board, University 9
Progression Requirement 25-26
Psychology, Department of 70-72
B.A. in 71
B.S. in 71-72
Minor 72
M.A. in 169-170
Course Descriptions 305-310
Public Administration, Master of 170-172
Admission 171
Course Descriptions 285-286
Public Relations, Office of 334
Public Safety, Department of 327
Public Service,
Development and 330
Publications, Student 9

-R-

Rathskeller 332
Reading, Course Descriptions 310-311
Reading and Elementary Education 88-90
B.A. in Elementary Education 89-90
M.Ed. in 143
Course Descriptions 234-235, 310-311
Readmission After Suspension or Termination 31
Readmission of Former Students 14
Readmission of Graduate Students 123
Readmission, Two-Year Rule and A.A. Degree Rule 14
Records, Privacy of 30
Records, Transcripts of 30
Refunds 20-21
Registration (General) 26-27
Registration, Graduate 26-27
Regulations, Academic 24-37
Regulation of Student Conduct 336-339
Religious Affairs 9-10
Religious Studies, Department of 72
B.A. in 72
Minor in 73
Course Descriptions 311-313
Repeating a Course 29, 127
Research, Course Descriptions 313
Research, Office of 331
Residence Halls 18, 332
Residence Requirements for Degree 33, 130
Residency Status for Tuition Payment 16-18
Responsibility, Student 24, 126
Code of 336-340
Returned Check Policy 16
Rocky River Wildlife Refuge 331
Room and Board, Cost of 18
ROTC Programs 116-118
Russian, Course Descriptions 314

-S-

Safety Services 327
Sanskrit Magazine 9
Scholarships 22-23
School Administration, MSA 147
Second Baccalaureate Degree 15, 27-28
Second Baccalaureate Major 15, 27
Second Master's Degree 128
Secondary Education,
Course Descriptions 314-315
Senior Citizens, Admission of 15
Service Learning Internships 118
Services, University 327-335
Social Work 73
Sociology, Anthropology, and Social Work
Department of 73-74
B.A. in Anthropology 73
B.A. in Sociology 73-74
B.S.W. (Social Work) 74
Minor in Anthropology 73
Minor in Social Work 74
Minor in Sociology 74
M.A. in Sociology 172
Course Descriptions
Anthropology 182-184
Social Work 317-318
Sociology 315-317
Sociology 73
Soccer 7
Softball 7
Sororities 9
Southeast Waste Exchange 335
Spanish
Major in 59
Minor in 59
Course Descriptions 318-319
Special Assessments 19
Special Education,
Course Descriptions 320-322
Special Programs 110-120
Speech. *See Communication Studies*
Sports, Intercollegiate 7-8
Intramural 7-8
Statistics, Course Descriptions 322-323
Stone Scholarships 23

Student Academic Integrity, Code of 336
Student Activities 7
Student Activities Fee 19
Student Activity Center 8
Student Advising for
Freshmen Excellence 329
Student Affairs 331-333
Student Center. *See Barnhardt Student Activity Center*
Student Employment Services 21, 333
Student Expenses 16
Student Life 7-10
Student Organizations 9
Student Orientation, New 14
Student Registration, New 14
Student Responsibility 24, 126, 336
Student Support Services 329
Student Teaching 88
Study Abroad 114-116
Summer Courses 334
Supplemental Educational
Opportunity Grant 21
Supplemental Instruction 329
Surcharge, Tuition 19, 25
Suspension, Academic 30-31
Suspension, Readmission After 31

-T-

Teacher Licensure 33
Teaching English as a Second
Language 144-145
Course Descriptions 323-324
Tennis 7
Termination of Enrollment 27
Termination, Readmission After 31, 127
Theatre. *See Dance and Theatre*
Time Limit (Graduate) 129
Traffic Division 327
Transcripts of Records 30
Transfer Students, Admission of 12, 18
Transfer Credit 31-32, 127-128
Transient Students, Admission of 15
Transient Study 32, 127-128
Translating, Concentration in 59
Course Descriptions 325
Travel Abroad 115-116
Trustees, Board of 343
Tuition and Fees 18-19
Tuition Surcharge 19, 25
Tutorial Services 329
Two-Year Rule 14

-U-

UNC Charlotte Code of
Student Academic Integrity 336
UNC Charlotte Code of
Student Responsibility 336
UNC Charlotte Grants 21
UNC Charlotte Campus Map . . . . Inside back cover
UNC Charlotte Uptown Center 327
Undergraduate Degrees 38-41
University Career Center 331
University Center. *See Cone Center*
University Honors, Course Descriptions . . . 264-265
University Honors Program 114
Admission 114
University Program Board 9
University Regulation of
Student Conduct 336-339
University Times 8
University Transition
Opportunity Program 329
University Writing Program 330
Uptown Center, UNC Charlotte 327
Urban Institute 334
Urban Studies 74
Minor 74

-V-

Venture Program 8
Veterans Benefits 22
Veterans, Children of 22
Veterinary Medicine 120
Violation of University Policy
or Regulations 336-339
Violations, Parking 19
Visiting Students, Admission of 15
Vocationally Handicapped,
Education for 22
Volleyball 7

-W-

Weapons, Regulations Concerning 336-337
Withdrawal 26-27
Women's Studies 74
Minor 74-75
Course Descriptions 325-326
Work/Study. *See Employment, Student*
Writing Resources Center 330

-Y-

Year in Video 9

Parking

Resident	R
Commuter	C
Both Resident and Commuter	B
Faculty	F
Visitor	V
Disabled	D
Not Open	X

UNC CHARLOTTE
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Academic Buildings	No.
Atkins (G5)	1
Barnard (G6)	2
Colvard (F6)	3
Denny (G6)	4
Fretwell (H6)	5
Friday (H5)	6
Garinger (G6)	7
Kennedy (G5)	8
Macy (G6)	9
McEniry (H5)	10
Physical Sciences Building (G4)	11
Rowe (G6)	12
Smith (G4)	13
Storrs (G7)	14
Winningham (G6)	15

Student Support/Administration	
Atkins Library (F5)	16
Auxiliary Services (H4)	17
Belk Gymnasium (E4)	18
Brocker Health Center (D5)	19
Cameron Research Center (H4)	20
Cone Center (F5)	21
McMillan Greenhouse (H4)	22
A. K. King (F5)	23
Bookstore (G5)	24
Physical Plant (H4)	25
Reese (F5)	26
Student Activity Center (F4)	27
Apartments	
Hunt Village (C5)	28
Martin Village (J5)	29
Phase III (J3)	30
Poplar Hall (H1)	31
High Rises	
Holshouser Hall (C6)	32
Moore Hall (D6)	33
Sanford Hall (E6)	34
Scott Hall (D6)	35
Phase IV Suites	
Cedar Hall (I4)	36
Hickory Hall (I4)	37
Sycamore Hall (I4)	38
Phase V Suites	
Elm Hall (H3)	39
Hawthorn Hall (K3)	40
Maple Hall (H3)	41
Oak Hall (H3)	42
Pine Hall (H3)	43
Dining Services	
Cafeteria/Activities Building (I4)	44
Prospector (G5)	45
Residence Dining Hall (D7)	46
Objects and Places of Interest	
Belk Tower (G6)	47
Van Landingham Glen (I5-6)	48
Sculpture Garden (G7)	49
Track and Field Complex (D3)	50
Alumni House	51

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